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United States
Department of
Agriculture

Cooperative State
Research Service

Food and Agriculture Competitively Awarded Research and Education Grants

Fiscal Year 1993

FOOD AND AGRICULTURE
COMPETITIVELY AWARDED
RESEARCH AND EDUCATION GRANTS
FISCAL YEAR 1993

UNITED STATES
DEPARTMENT OF
AGRICULTURE

PREPARED BY THE OFFICE OF GRANTS
AND PROGRAM SYSTEMS, COOPERATIVE
STATE RESEARCH SERVICE

JANUARY 1994

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FOREWORD

Research and Education are the keystones to this Nation's continuing success in agriculture, food and forestry while enhancing our natural resources. This publication lists the grants supported in a wide variety of programs in the Cooperative State Research Service. These programs are in addition to the research programs supported on a formula basis at eligible universities.

The National Research Initiative Competitive Grants Program supported research in the following research divisions: Natural Resources and the Environment; Nutrition, Food Quality and Health; Animal Systems; Plant Systems; Markets, Trade, and Policy; and Processing for Value-added or Developing New Products. A Strengthening Awards Program was also supported. Grants are listed under the research programs in each of the above divisions as well as under major cross-cut headings where subjects such as forest biology, global change, etc. were supported in several program areas.

The Biotechnology Risk Assessment Program supported biotechnology risk assessment research to help address concerns about the effects of introducing certain biotechnology products into the environment and to help regulators develop policies concerning the introduction of such products.

The Special Research Grants Program provided competitively awarded grants in aquaculture, water quality and wood utilization.

The Rangeland Research Grants Program supported research to improve productivity of the Nation's rangeland.

The USDA National Needs Graduate Training Grants Program, initiated in 1984, has achieved a notable record and is proving to be an important part of the solution to the serious erosion of our food and agricultural scientific expertise. The FY 1993 National Needs Graduate Fellowships Program supported pre-doctoral fellows in the areas of plant biotechnology; food, forest, biological, or agricultural engineering; and water science.

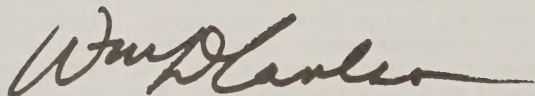
The Higher Education Challenge Grants Program supported projects focusing on curricula design and materials development, faculty preparation and enhancement, instruction delivery systems, and student experiential learning.

The Capacity Building Grants Program, targeted to the 1890 Institutions and Tuskegee University, supported high priority research projects, as well as teaching projects in the areas of curricula design and materials development, faculty preparation and enhancement, instruction delivery systems, scientific instrumentation for teaching, student experiential learning, and student recruitment and retention.

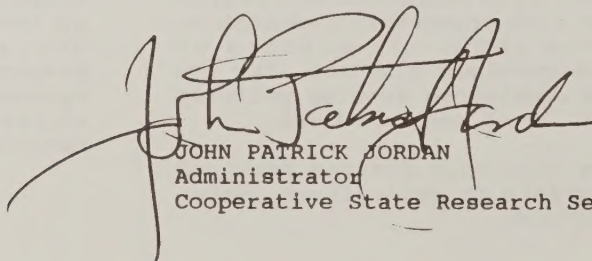
The U.S. Department of Agriculture (USDA) supports a Small Business Innovation Research (SBIR) Program. The USDA SBIR Program supports high quality research proposals, from qualified small businesses, that address important problems facing American agriculture. The USDA SBIR Program has proven to be an effective mechanism for commercialization of important agricultural technologies.

Scientists who served on CSRS peer review panels in 1993 are listed.

In order to keep U.S. agriculture strong, resilient, and moving forward, this combination of research, teaching, and fellowship programs to attack important and difficult problems in agricultural sciences serves to provide the broad knowledge base essential to reduce costs and keep U.S. agriculture competitive in the world marketplace.



WILLIAM D. CARLSON
Associate Administrator
Office of Grants and Program Systems
Cooperative State Research Service



JOHN PATRICK JORDAN
Administrator
Cooperative State Research Service

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This publication was prepared by the Awards Management Division, Office of Grants and Program Systems, Cooperative State Research Service, U.S. Department of Agriculture.

Limited copies are available from the following offices: CSRS Information Office, Ag Box 2208, Washington, DC 20250-2208, the National Research Initiative Competitive Grants Office, Ag Box 2241, Washington, DC 20250-2241 and the Proposal Services Branch, Ag Box 2245, Washington, DC 20250-2245.

FOOD AND AGRICULTURE COMPETITIVELY AWARDED RESEARCH AND EDUCATION GRANTS FISCAL YEAR 1993

THE GRANTS PROGRAMS

The research grants programs of science and education under which the competitive selection process was used during fiscal year 1993 were the following:

1. National Research Initiative Competitive Grants Program to support basic and mission-linked research in the food and agricultural sciences.

2. Biotechnology Risk Assessment Program to support research to help address concerns about the effects of introducing certain biotechnology products into the environment and to help regulators develop policies concerning the introduction of such products.

3. Rangeland Research Grants Program to support basic research in certain areas of rangeland research.

These sources of funding supplement and complement funding of Federal agricultural research and the base State research institution formula funding by Congress to help maintain a viable, effective, ongoing State-Federal agricultural research capability for this country.

In addition, grants were awarded competitively under the following programs:

4. Food and Agricultural Sciences National Needs Graduate Fellowships Grants Program to help develop professional and scientific expertise in the food and agricultural sciences.

5. Capacity Building Grants Program to support competitive grants at the 1890 Institutions and Tuskegee University, to strengthen institutional capacities in food and agricultural sciences teaching programs and research.

6. Higher Education Challenge Grants Program to support competitive grants to strengthen teaching programs in the food and agricultural sciences at U.S. colleges and universities.

7. Small Business Innovation Research Program, a primary aim of which is to stimulate technological innovation in the private sector.

Grant funds for all of the above programs are administered through the Cooperative State Research Service.

Guidelines for grants to be awarded competitively are published annually in the Federal Register, usually near the beginning of each fiscal year. The guidelines identify selected areas to be supported, anticipated funding levels, and requirements for the submission of proposals.

If you want further information on programmatic aspects of these grants, contact:

Dr. William D. Carlson
Associate Administrator
Office of Grants and Program Systems
Cooperative State Research Service
U.S. Department of Agriculture
Washington, D.C. 20250-2240

If you want information on administrative aspects of these grants, contact:

Mr. Terry J. Pacovsky
Director
Awards Management Division
Office of Grants and Program Systems
Cooperative State Research Service
U.S. Department of Agriculture
Washington, D.C. 20250-2245

Single copies or annual or semiannual subscriptions for the Federal Register are available for a small charge from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The following are listings of awards (arranged by program areas) for fiscal year 1993. Please note that some of these awards are renewals, continuation awards, or other amendments to existing projects and are identifiable by agreement periods starting prior to October 1, 1992. These grants were reviewed and awarded in the current fiscal year. The agreement period reflects the total of the previous and current award periods; the funds shown are for the current award period only.

++Continuation Award - when shown, indicates awarded projects that were reviewed in a prior fiscal year. Funds are allotted each year over the duration of the grant. Please note that the agreement period indicates the total length of the award. However, the funds shown are for the current fiscal year increment only.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM

The following tabulation lists the funds awarded in the various divisions and programs in fiscal year 1993 under the National Research Initiative Competitive Grants Program. Also included are the total number of awards funded within each division.

Natural Resources and the Environment	\$16,994,105	Plant Systems	<u>\$37,607,593</u>
<i>(Total 146 Awards)</i>		<i>(Total 371 awards)</i>	
Plant Responses to the Environment		Plant Genetic Mechanisms and Molecular Biology	
* Forest/Rangeland/Crop Ecosystems		Plant Growth and Development	
Water Quality		Photosynthesis and Respiration	
Improved Utilization of Wood		Nitrogen Fixation/Metabolism	
and Wood Fiber		Plant Pathology/Weed Science	
Triagency Natural Resources		Entomology/Nematology	
+ Natural Resources, Strengthening		* PS-Forest/Rangeland/Crop Ecosystems	
		Alcohol Fuels	
		Plant Genome	
		Triagency Plant Systems	
		+ Plant Systems, Strengthening	
Nutrition, Food Quality and Health	<u>\$6,134,505</u>	Markets, Trade and Policy	<u>\$3,782,400</u>
<i>(Total 49 awards)</i>		<i>(Total 36 awards)</i>	
Human Nutrient Requirements for		Markets, Competitiveness and Technology	
Optimal Health		Rural Development	
Food Safety		+ Markets, Strengthening	
+ Nutrition, Strengthening			
Animal Systems	<u>\$23,518,647</u>	Processing for Adding Value or	<u>\$3,777,230</u>
<i>(Total 156 awards)</i>		Developing New Products	<i>(Total 32 awards)</i>
Reproductive Biology of Animals		Processing for Value-added Products	
Cellular Growth and Developmental		+ Processing, Strengthening	
Biology of Animals			
Animal Molecular Genetics and Gene Mapping			
Mechanisms of Animal Disease			
+ Animal Systems, Strengthening			
		Cross-Divisional or Cross-Programatic Areas:	
		Forestry Related Research	
		Global Change Research	
		Animal Health Related Research	
		Animal Genetic Related Research	
*Reviewed as one program			
+Reviewed as one program			

The authority for this program is contained in section 2 (b) of the Act of August 4, 1965, as amended (7 U.S.C. 450i(b)). Proposals may be submitted by any State agricultural experiment station, college, university, other research institution or organization, Federal agency, private organization, corporation, or individual. Proposals from scientists at non-United States organizations are not eligible for support.

NATURAL RESOURCES AND THE ENVIRONMENT

Research in the area of natural resources and the environment addresses contemporary issues important for agriculture and for society. Knowledge in diverse scientific disciplines is needed in order to understand the influence of environmental fluctuations, to foster sustainability and economic viability, and to enhance stewardship of natural resources and agriculturally important ecosystems. Program Areas in this Division include: Plant Responses to the Environment; Forest/Rangeland/Crop Ecosystems; Water Quality; and Improved Utilization of Wood and Wood Fiber.

NATURAL RESOURCES AND THE ENVIRONMENT

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PLANT RESPONSES TO THE ENVIRONMENT

Awards in this area support research aimed at understanding the plant's response to environmental factors, both natural and anthropogenic. The major goal of the program is to provide the basic knowledge needed for devising strategies for decreasing the impact of environmental stress and for adapting agricultural and forest practices to possible changes predicted to accompany global climate fluctuations.

Studies on mechanisms at the whole plant, cellular or molecular level which explain organismal response are emphasized. The environmental factors of interest include water, temperature, light (including UV-B), nutrient, and atmospheric chemical composition (including carbon dioxide and other greenhouse gases, sulfur dioxide and ozone).

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Molecular and Cellular Mechanisms of Stress Tolerance in Plants -- 1993 NATO Workshop	J. Cherry	93-37100-8596	\$ 3,000	05/15/93- 11/30/93
University of Arizona Tucson, AZ 85721 Title: Polyol Synthesis and Stress Resistance in Transgenic Plants	R. Jensen	93-37100-8868	\$ 180,000	08/01/93- 07/31/96
University of Arizona Tucson, AZ 85721 Title: Role of Class I Small HSPs in Plant Development and Thermotolerance	E. Vierling	93-37100-9061	\$ 190,000	09/15/93- 09/30/96
Individual Awardee Berkeley, CA 94720-1144 Title: Consequences of Male Resource Allocation for Plant Growth and Yield	V. Eckhart	93-37100-9010	\$ 61,400	09/01/93- 08/31/95
The Regents of the University of California Berkeley, CA 94720 Title: The Role of Galactose Oligosaccharides (GO) in Seed Desiccation Tolerance	B. de Lumen	93-37100-8905	\$ 100,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Molecular Characterization of the Early-Salt-Stress Response in the Salt-Tolerant Lophopyrum Elongatum	J. Dvorak	93-37100-9288	\$ 90,000	09/15/93- 09/30/95
The Regents of the University of California Los Angeles, CA 90024-1406 Title: Stomatal Control in Agricultural Crops	E. Zeiger	91-37100-6613	\$ 100,000	09/01/91- 08/31/95
The Regents of the University of California Riverside, CA 92521 Title: Mechanisms of Biosynthesis of Plant Metal-Binding Peptides, Phytochelatins	R. Mehra	93-37100-8938	\$ 130,000	08/15/93- 08/31/95
The Regents of the University of California Riverside, CA 92521 Title: Heat Shock Response in Higher Plants	D. Gallie	93-37100-8939	\$ 100,000	09/01/93- 08/31/95
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Intermittent Warming of Tomato Roots	M. Gent	93-37100-9101	\$ 90,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Carnegie Institution of Washington Washington, DC 20005 Title: Acclimation of Chlamydomonas to Sulfur Limitation	A. Grossman	93-37100-9100	\$ 200,200	09/01/93-08/31/96
University of Florida Gainesville, FL 32611 Title: Structure and Function of CAPs 160 and 85	C. Guy	93-37100-8906	\$ 190,000	09/01/93-08/31/96
University of Florida Gainesville, FL 32611 Title: Absorbing Surface Area of Southern Pine Root Systems:	N. Comerford S. Torreano	93-37100-8869	\$ 120,000	09/15/93-09/30/95
USDA/ARS South Atlantic Area, Athens, GA 30613 Title: Regulation of Nitrate Transport in Roots of Phosphorus-Deficient Plants	T. Ruffy R. Volk D. Lazof	93-37100-8940	\$ 160,000	08/01/93-07/31/96
University of Hawaii, Manoa Honolulu, HI 96822 Title: Mechanism and Regulation of Xanthophyll-Dependent Protection of PSII Photochemistry	H. Yamamoto	93-37100-9062	\$ 210,000	09/01/93-08/31/96

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Hawaii, Manoa Honolulu, HI 96822 Title: Physiological Responses of Species Having Crassulacean Acid Metabolism to CO2 Enrichment and Temperature	D. Bartholomew G. Goldstein	93-37100-9480	\$ 61,800	09/15/93- 09/30/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Identification of Traits Which Impart Freezing Tolerance in Arabidopsis thaliana	E. Ashworth	93-37100-8838	\$ 90,000	08/01/93- 07/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Salt and Drought Tolerance of FB Maize Lines Differing for Glycinebetaine	D. Rhodes R. Joly P. Goldsbrough	93-37100-8870	\$ 120,000	08/15/93- 08/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Characterization of the Gene and Enzyme of the First Step of Proline Synthesis	L. Csonka R. Bressan	93-37100-8871	\$ 190,000	09/01/93- 08/31/96
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803 Title: 1st International Symposium of Plant Dormancy	G. Lang T. Chen R. Darnel A. Khan	93-37304-9372**	\$ 3,500	09/15/93- 09/30/94

** Split Funded Award

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
President and Fellows of Harvard University Cambridge, MA 02138 Title: Latitudinal Variation in Birch Responses to Elevated CO2 and Climate Change	P. Wayne	93-37100-9012	\$ 87,160	09/15/93- 09/30/95
Massachusetts Institute of Technology Cambridge, MA 02139 Title: Stomatal Signal Transduction: Physiology, Arabidopsis Mutants, and Biochemistry	E. Kearns	93-37100-9556	\$ 81,640	09/15/93- 09/30/95
University of Maryland College Park, MD 20742 Title: Zeaxanthin-mediated Photoprotection in Oxygenic Photosynthetic Organisms	E. Gantt F. Cunningham	93-37100-9011	\$ 120,000	09/15/93 09/30/95
University of Maine Orono, ME 04469-5715 Title: A Factor Mediating Translational Activity During Environmental Stress	M. Vayda	91-37100-6622	\$ 150,000	09/01/91- 08/31/95
Michigan State University East Lansing, MI 48824 Title: Salinity Tolerance and Regulation of Mannitol Metabolism	W. Loescher R. Grumet J. Everard	93-37100-8907	\$ 60,000	08/01/93- 07/31/94

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Phosphorus-Stress Induced Changes in Carbon Metabolism and Assimilation in Lupin	D. Allan C. Vance	93-37100-8941	\$ 110,000	08/15/93- 08/31/95
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Distribution and Activity of Dehydrin-like Proteins in Plants and Cyanobacteria	P. Lammers	93-37100-8920	\$ 65,000	08/01/93- 07/31/95
Research Foundation of State University of New York Albany, NY 12201 Title: Role of Ca ²⁺ in Detection of and Response to Salinity-induced Changes in Turgor	M. Bisson	93-37100-8872	\$ 110,000	09/01/93 08/31/95
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Ozone-induced Changes in Seasonal Growth and Carbon Allocation in Sugar Maple	M. Topa	93-37100-8914	\$ 231,600	09/01/93- 08/31/96
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Approaches to Improve the UV-B Resistance of Arabidopsis thaliana	J. Sheahan	93-37100-8992	\$ 66,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Cold-Regulated (COR) Proteins: Cryobehavior and Effects on Cryostability of Membranes	P. Steponkus	93-37100-8835	\$ 130,000	08/01/93-07/31/95
Siena College Loudonville, NY 12211-1462 Title: The Function of Small Heat Shock Proteins in the Endomembrane System	K. Helm	93-37100-9266	\$ 120,000	09/15/93-09/30/96
The New York Botanical Garden Millbrook, NY 12545 Title: Carbohydrate Economy in Relation to Ecological Patterns of Tree Regeneration	C. Canham R. Chazdon	93-37100-8873	\$ 100,000	09/01/93-08/31/95
Miami University Oxford, OH 45056 Title: Epidermal Flavonoids and UV-B Attenuation: Plant Responses to Ozone Depletion	J. McClure A. Huerta	93-37100-8836	\$ 130,000	07/01/93-06/30/95
Agricultural Expt. Station Oklahoma State University Stillwater, OK 74078 Title: The Effect of Regeneration Methods on Genetic Diversity in Shortleaf Pine	R. Wittwer C. Tauer	93-37100-9013	\$ 90,008	09/01/93-08/31/96

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Oregon State University Corvallis, OR 97331 Title: Workshop on Stems and Trunks in Plant Form and Function	B. Gartner	93-37100-9063**	\$ 5,020	09/01/93-06/30/94
University of Oregon Eugene, OR 97403 Title: Genetic Analysis of the Photoperiodic Induction of Flowering in Arabidopsis	D. Meeks-Wagner	93-37100-9189	\$ 130,000	09/01/93-08/31/95
USDA/ARS North Atlantic Area Philadelphia, PA 19118 Title: The Role of Aluminum Interactions with Calcium Channels and Calcium Homeostasis in Al Toxicity and Tolerance	L. Kochian	93-37100-8874	\$ 160,000	09/01/93-08/31/96
Pennsylvania State University University Park, PA 16802-1003 Title: Dendrochemical Detection of Soil Chemistry Trends Associated with Global Change	D. DeWalle W. Sharpe P. Edwards	93-37100-9164	\$ 100,000	09/01/93-08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Linking O ₃ -induced ACC Synthase, Loss in rbcS and Accelerated Foliar Senescence	E. Pell R. Arteca	93-37100-8921	\$ 190,000	09/01/93-08/31/96

** Split Funded Award

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of South Dakota Vermillion, SD 57069-2390 Title: The Role of Vitrified Sugars in Plant Desiccation Tolerance	K. Koster	93-37100-8993	\$ 100,000	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Induction of the Tonoplast H ⁺ -ATPase by ABA and NaCl	M. Binzel	93-37100-8951	\$ 100,000	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Perception and Signaling of Physical Stress Cues in Maize Roots	P. Morgan W. Jordan	93-37100-8952	\$ 190,000	09/01/93-08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Metabolic Acclimation of Root Cells to Oxygen Deficiency	M. Drew B. Cobb D. Andrews	93-37100-8922	\$ 191,000	09/01/93-08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Genes Induced by Plant Water Deficit	J. Mullet	93-37100-9014	\$ 190,000	09/01/93-08/31/96

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas Tech University Lubbock, TX 79409-1035 Title: Oxidative Stress: Interactions Between Protective Enzymes in Chloroplasts	R. Allen A. Holaday	93-37100-8923	\$ 151,700	09/01/93- 08/31/95
Texas Tech University Lubbock, TX 79409-1035 Title: The Interactive Effects of Companion Plants on VAM Development, Growth, and Production of Cotton on the Southern High Plains	J. Zak B. McMichael D. Upchurch T. Zobeck	93-37100-9064	\$ 90,000	09/01/93- 08/31/95
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Nutrient Mediated Susceptibility of Red Spruce to Winter Injury	T. Perkins	93-37100-8994	\$ 120,000	09/01/93 08/31/96
Washington State University Pullman, WA 99164-5045 Title: Wind Effects of Canopy Conductance and the Mass and Energy Balance of Plant Communities	C. Stockle	93-37100-8953	\$ 120,000	09/01/93- 08/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Tree Response to Elevated CO2 and Herbivory: Growth, Physiology and Insect Performance	E. Kruger R. Lindroth J. Volin	93-37100-8856	\$ 190,000	08/01/93- 07/31/96

National Research Initiative Competitive Grants Program
Plant Responses to the Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Genetics of Freezing Tolerance and Plasma Membrane Lipid Changes with Acclimation	J. Palta J. Bamberg	93-37100-8924	\$ 190,000	09/01/93- 08/31/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Assessing UV-B Constraints on Photosynthetic Capacity: Linking Leaf Structure to Function	T. Day	93-37100-8875	\$ 155,100	09/15/93- 09/30/96
University of Wyoming Laramie, WY 82071 Title: Influence of Leaf Anatomy and Growth Conditions on Photoinhibition Within Leaves	J. Nishio T. Vogelmann	93-37100-8855	\$ 210,000	08/01/93 07/31/96

Total : \$ 6,624,128

NATURAL RESOURCES AND THE ENVIRONMENT

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FOREST/RANGELAND/CROP ECOSYSTEMS

The goal of this program area is to further the understanding of underlying biological and ecological processes in ecosystems. This understanding is needed to develop management strategies that will improve environmental quality while ensuring that land use policy does not exceed the capacity of ecosystems to sustain a given use. Investigations on how landscapes function at ecophysiological, population, community, and biogeochemical levels will provide knowledge essential for improving agricultural and forestry practices. Studies on whole ecosystems or components of ecosystems were encouraged in, but were not limited to, the following areas: (1) influence of abiotic and biotic factors on carbon, nutrient, water and energy flow in ecosystems and on the mechanisms that control such fluxes, (2) soil physical and chemical properties and processes that affect water and nutrient availability, (3) responses of plant communities and soil food webs to management practices, disturbance and environmental change (including successional and mycorrhizal studies), and (4) interspecific antagonisms and interactions among plants in relationship to management practices.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Ecosystems Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
USDA, ARS, Pacific West Area Albany, CA 94710 Title: Impacts of Granivory on Indian Ricegrass Populations	W. Longland S. Jenkins S. Vander Wall	93-37101-8995	\$ 200,000	09/01/93- 08/31/96
The Regents of the University of California Berkeley, CA 94720 Title: Genetic Structure of Heterobasidion annosum in White Fir (Abies concolor) Root Decay Centers	T. Bruns F. Cobb	93-37101-8701	\$ 175,000	08/01/93- 07/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Decomposition of Plant Residues and Suppression of Root Diseases in Organic Farms	A. van Bruggen	93-37101-8600**	\$ 250,000	08/01/93 07/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Regeneration of Pinyon-Juniper Woodland and Nitrogen Fixation by Purshia tridentata	A. Berry	93-37101-8863	\$ 56,000	08/15/93- 08/31/95
Colorado State University Fort Collins, CO 80523 Title: Effects of N Availability on the Rate of Rangeland Recovery on Abandoned Semiarid Croplands	E. Redente T. McLendon D. Klein	93-37101-8601	\$ 198,000	09/01/93- 08/31/96

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Ecosystems Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Colorado State University Fort Collins, CO 80523 Title: Controls on the Allocation of Production in Coniferous Forest Ecosystems	F. Smith J. Long A. Schoettle	93-37101-9015	\$ 175,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Impacts of Clearcutting on Important Animal Populations in Cypress Ponds	K. Ewel	93-37101-9102	\$ 175,000	09/15/93- 12/31/96
Iowa State University of Science and Technology Ames, IA 50011 Title: Microclimate Impacts of Shelterbelts on Agroforestry Ecosystems	E. Takle R. Schmidt J. Brandle	93-37101-8954	\$ 295,016	08/01/93- 07/31/96
Purdue Research Foundation West Lafayette, IN 47907 Title: Effect of Forest Fragmentation on Mammals in an Agricultural Landscape	R. Swihart	93-37101-8702	\$ 120,000	08/01/93- 08/31/96
Southern Forest Expt. Station USDA Forest Service New Orleans, LA 70113 Title: Herbivory and Plant Interactions in Bottomland Hardwood Experimental Gaps	W. Smith	93-37101-8662	\$ 315,000	09/01/93- 08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Ecosystems Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: Nitrous Oxide and Methane Fluxes in Agricultural Ecosystems	G. Robertson	93-37101-9016	\$ 125,000	09/01/93- 08/31/96
Duke University Durham, NC 27708 Title: Response of Western Montane Forest Ecosystems to Global Climate Change	W. Schlesinger	91-37101-6724++	\$ 127,000	09/01/91- 08/31/94
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Grassland Patchiness and the Scaling of Soil Nitrogen	M. Biondini C. Grygiel	93-37101-8996	\$ 135,000	09/15/93 09/30/96
University of New Hampshire Durham, NH 03824 Title: Carbon Controls on Nitrogen Retention by Temperate Forest Ecosystems	W. McDowell J. Aber R. Boone	93-37101-8700	\$ 292,000	08/01/93- 07/31/96
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Recent Changes in Nutrient Concentrations in the Northern Hardwood Forest	R. Yanai M. Arthur	93-37101-8582	\$ 228,273	05/15/93- 05/31/96

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Ecosystems Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Response of Pin Cherry-Northern Hardwood Stands to Changes in Resource Availability	T. Fahey	92-37101-7438++	\$ 92,000	07/01/92-06/30/95
Research Foundation of State University of New York Albany, NY 12201 Title: Virus Infection of Red Spruce: Mechanisms of Spread and Relationship to Decline	J. Castello M. Schaedle S. Rogers	93-37101-8837	\$ 210,000	09/01/93-08/31/96
Ohio State University Research Foundation Columbus, OH 43210 Title: Farming Systems Effects on N Use Efficiency in Temperate and Tropical Agricultural Systems	R. Lal	91-37309-6886	\$ 7,596	09/15/91-09/30/94
USDA/ARS North Atlantic Area Philadelphia, PA 19118 Title: Effect of Conventional and Sustainable Agriculture Upon Mycorrhizal Fungi	D. Douds R. Janke G. Becard	92-37101-7439++	\$ 75,000	09/01/92-08/31/94
William Marsh Rice University Houston, TX 77251-1892 Title: Rice Field Management and Mitigation of Methane Emissions	R. Sass F. Fisher	91-37101-6814++	\$ 100,000	09/15/91-09/30/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Ecosystems Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Vermont and State Agricultural College Burlington, VT 05405	D. Ross R. Bartlett F. Magdoff	93-37101-8997	\$ 80,000	09/15/93- 09/30/95
Title: What Determines the pH in Acid Forest Soil Surface Horizons				
Board of Regents of the University of Wisconsin System Madison, WI 53706	D. Waller	93-37101-8661	\$ 200,000	07/01/93- 06/30/96
Title: Effects of Alternative Landscape Management on Forest Tree Regeneration				

Total : \$ 3,630,885

NATURAL RESOURCES AND THE ENVIRONMENT

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WATER QUALITY

Non-point runoff of water contaminants and pollutants such as pesticides and other organics, inorganic nutrients, animal wastes, excess salts and metals is a major landscape problem. Grants in this area support research that will improve understanding of ecological, biochemical, chemical and physical processes affecting water quality.

Investigations into mechanisms that affect accumulation, persistence, degradation and transport of water contaminants and pollutants are supported in the following scientific disciplines: (1) Wetlands and riparian systems, (2) Soil chemistry and physics, (3) Microbial ecology and biochemistry, and (4) Plant/rhizosphere/water contaminant interactions.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Addition of GCMS Equipment for Expanding Research Capabilities	T. Lavy	93-37106-9486	\$ 32,283	09/15/93- 09/30/94
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Molecular Simulation of Adsorption at the Clay Mineral/Solution Interface	D. Miller L. Schafer B. Teppen	93-37102-9557	\$ 168,500	09/15/93- 09/30/96
The Regents of the University of California Davis, CA 95616-8671 Title: Sorption and Transformation of As(V)/As(III) in Ground Water, Tulare Basin, CA	K. Tanji R. Fujii	93-37102-9017	\$ 100,000	09/15/93 09/30/95
The Regents of the University of California Riverside, CA 92521 Title: Recovering History of Groundwater Contamination by Tikhonov Regularization	Z. Kabala	93-37102-9393	\$ 58,000	09/15/93- 09/30/95
Xenometrix, Inc. Boulder, CO 80301 Title: Molecular Analysis of Dehalogenation of Pentachlorophenol	C. Orser	93-37102-9630	\$ 250,000	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Rates of Uptake and Release of Organic Compounds by Soil Particles	J. Pignatello F. Ferrandino	93-37102-8975	\$ 160,000	09/01/93-08/31/96
USDA/ARS South Atlantic Area Athens, GA 30613 Title: Effects of Management and Ecosystem Type on Nutrient Retention in Riparian Zones	R. Lowrance M. Beare J. Meyer	93-37102-8955	\$ 298,000	09/15/93-09/30/96
University of Idaho Moscow, ID 83843 Title: Duration and Intensity of Epiaquic Conditions in a Soil Climosequence	P. McDaniel	93-37106-9397	\$ 49,949	09/15/93-09/30/95
University of Idaho Moscow, ID 83843 Title: Arsenate Sorption in Flooded Soils	S. McGeehan S. Fendorf	93-37106-9402	\$ 46,991	09/15/93-09/30/95
University of Idaho Moscow, ID 83843 Title: Precipitation and Oxidation Reactions of Cr at the Solid Solution Interface	S. Fendorf	93-37102-9481	\$ 145,000	09/15/93-09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Surface Chemistry of Oxidized and Reduced Phyllosilicates	J. Stucki	93-37102-8957	\$ 198,000	09/15/93- 09/30/96
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Winter Annual Root Development and the Scavenging of Residual Soil Nitrate	J. Grove R. Blevins D. Zourarakis	91-37102-6790	\$ 49,400	09/15/91- 09/30/94
Michigan State University East Lansing, MI 48824 Title: Mechanistic and Structural Characterization of a Bacterial Urease	R. Hausinger P. Karplus	91-37305-6515	\$ 180,000	09/01/91- 08/31/95
Montana State University Bozeman, MT 59717 Title: Improving Multi-Element Analytical Facilities for Research in Water Quality	W. Inskip J. Wraith J. Bauder	93-37106-9401	\$ 50,000	09/15/93- 09/30/94
University of North Carolina at Chapel Hill Chapel Hill, NC 27599-4100 Title: Physiological and Ecological Controls of Cyanobacterial Bloom Dynamics in Hypereutrophic Waters: Mechanisms and Management Opt	H. Paerl J. Pinckney	93-37102-9103	\$ 264,200	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Nebraska Lincoln, NE 68588-0430 Title: Metal-Specific Antibodies for Environmental Testing	D. Wylie	93-37102-9018	\$ 272,000	09/01/93-08/31/96
University of New Hampshire Durham, NH 03824 Title: Carbon Controls on Nitrogen Retention by Temperate Forest Ecosystems	W. McDowell J. Aber R. Boone	93-37101-8700	\$ 292,000	08/01/93-07/31/96
University of New Hampshire Durham, NH 03824 Title: Riparian Influences on Water Quality from Natural and Afforested Grasslands	W. Bowden	93-37106-9398	\$ 78,841	09/15/93-09/30/94
Rutgers, The State University Piscataway, NJ 08855-1089 Title: Molecular and Genetic Analysis of Anaerobic Toluene Utilization	P. Coschigano	93-37102-8998	\$ 88,816	09/15/93-09/30/95
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Denitrification as a Means to Remediate Groundwater Contaminated with Dairy Waste	Z. Samani	93-37106-9621	\$ 50,000	09/15/93-09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Biodegradation and Mechanisms of Formation of Aged Chemicals in Soils	M. Alexander	93-37102-8976	\$ 100,000	09/01/93-08/31/96
Cornell University Ithaca, NY 14853 Title: Transport Pathways and Fate of Cryptosporidium parvum	M. Walker M. Walter W. Ghiorse A. Pell	93-37102-8958	\$ 175,800	09/15/93-09/30/96
Ohio State University Research Foundation Columbus, OH 43210 Title: Earthworm Control of Soil Microbial/Physical Processes Influencing Nitrogen Transport	C. Edwards W. Edwards	93-37102-8959	\$ 160,000	09/01/93-08/31/95
Ohio State University Research Foundation Columbus, OH 43210 Title: The Role of Organic Colloids in the Compartmentalization of Pesticides in Wetlands	Y. Chin S. Traina	93-37102-8960	\$ 84,000	09/01/93-08/31/96
Oregon State University Corvallis, OR 97331 Title: Water Quality and Nitrifying Bacteria: A Molecular Approach	D. Arp	91-37102-6862++	\$ 64,838	09/15/91-09/30/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Hydrologic Flowpaths in the Nearstream Zone: Implications for Modelling Stream Chemistry	D. DeWalle T. Johnson	93-37102-9104	\$ 225,000	09/01/93- 08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Catalytic Destruction of Organophosphate Pesticides by Metal-Bearing Resins	M. Natan	93-37102-9105	\$ 82,000	09/15/93- 09/30/95
Clemson University Clemson, SC 29634-5326 Title: HPLC Addition for Multi-User Analytical Laboratory	M. Riley	93-37106-9328	\$ 26,280	09/15/93 09/30/94
Texas A&M Research Foundation College Station, TX 77843 Title: Chemical and Physical Characteristics of Water Flow Paths in Structured Soil	K. McInnes	93-37102-9019	\$ 178,000	09/01/93- 08/31/96
William Marsh Rice University Houston, TX 77251-1892 Title: Rice Field Management and Mitigation of Methane Emissions	R. Sass F. Fisher	91-37101-6814++	\$ 100,000	09/15/91- 09/30/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Vermont and State Agricultural College Burlington, VT 05405	D. Ross W. Jokela D. Wang J. Hughes	93-37106-9327	\$ 20,188	09/15/93- 09/30/94
Title: Acquisition of an Automated Ion Analyzer				
Board of Regents of the University of Wisconsin System Madison, WI 53706	W. Bleam P. Helmke	93-37102-9065	\$ 100,000	09/01/93- 08/31/96
Title: Lead Retention by Soil Colloids				
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506	A. Shiemke	93-37102-8999	\$ 177,000	09/01/93 08/31/96
Title: Isolation and Characterization of Membrane-Bound Methane Monooxygenase				

Total : \$ 4,325,086

NATURAL RESOURCES AND THE ENVIRONMENT

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IMPROVED UTILIZATION OF WOOD AND WOOD FIBER

Improved wood utilization practices depend upon a continually advancing scientific foundation of basic research in wood properties and fundamental components of wood science. This program area supports research that addresses critical barriers to improved wood utilization and that will provide the scientific base from which new research and development can proceed. The major areas of focus include: (1) wood chemistry and biochemistry, (2) physical and mechanical properties of wood and basic wood processing technology, (3) structural wood engineering, and (4) forest engineering research. Innovative approaches to solving fundamental problems in the field of wood science and technology are encouraged.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Berkeley, CA 94720 Title: Elastic Waves in Wood: Modeling and Measurement	G. Johnson	93-37103-9320	\$ 95,000	09/15/93- 09/30/95
Colorado Seminary University of Colorado Denver, CO 80208 Title: Development of High Sensitivity Wideband Acoustic Sensors for Wood	M. Hamstad	93-37103-9106	\$ 120,000	09/15/93- 09/30/95
Colorado State University Ft. Collins, CO 80523 Title: The Evaluation of System Behavior in Wood Joist Floor Systems	P. Pellicane	93-37103-9290	\$ 70,000	09/15/93- 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Production of Thermostable Xylanases for Pulp Bleaching	K. Eriksson J. Westpheling J. Dean M. Adams	93-37500-9596	\$ 160,000	09/15/93- 03/31/96
Institute of Paper Science and Technology Atlanta, GA 30318 Title: Flotation Deinking of Electrostatically-Printed Paper	R. Stratton	93-37500-9251	\$ 88,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Idaho Moscow, ID 83843 Title: Impact of Log Form Upon Warp in Structural Grades of Softwood Lumber	F. Wagner F. Taylor	93-37103-9395	\$ 58,000	09/15/93- 09/30/95
USDA/ARS Mid-West Area Peoria, IL 61604 Title: Development of a Selective Method for Quantitation and Localization of Alpha-ethers in Lignins	J. Ralph	93-37103-9155	\$ 110,000	09/01/93- 08/31/95
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Activated Carbons from Wood and Wood Fiber Precursors	F. Derbyshire M. Jagtoyen	93-37103-9394	\$ 100,000	09/15/93 09/30/95
Southern Forest Expt. Station USDA Forest Service New Orleans, LA 70113 Title: Exploring the Interphase in Wood-Polymer Composites	T. Rials J. Simonsen	93-37103-9319	\$ 95,000	09/15/93- 09/30/95
University of Maryland College Park, MD 20742 Title: Mechanics of Variable Moisture Induced Tensile Creep Acceleration in Paper	H. Haslach, Jr.	93-37103-9558	\$ 75,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maine Orono, ME 04469-5715	B. Goodell J. Jellison F. Fekete	93-37103-9107	\$ 68,940	09/15/93- 09/30/95
Title: The Role of Biological Chelators Produced by Fungi in Lignocellulose Degradation				
The Regents of the University of Minnesota Minneapolis, MN 55415-1226	B. Brashaw	93-37103-9593	\$ 48,941	09/15/93- 09/30/95
Title: Stress Wave Nondestructive Evaluation of Green Veneer				
MS Forest Products Laboratory Mississippi State University Mississippi State, MS 39762	M. Kim H. Stewart	93-37103-9396	\$ 52,006	09/15/93 09/30/95
Title: Tool Wear Effects of Certain Anionic Components in UF Resin- Bonded Particleboard				
MS Forest Products Laboratory Mississippi State University Mississippi State, MS 39762-5724	H. Barnes J. Winandy T. Conners	93-37103-9317	\$ 105,000	09/15/93- 09/30/97
Title: Factors Affecting the Strength of Fire Retardant-Treated Plywood in Lab and Field Studies				
North Carolina State University Raleigh, NC 27695-7003	R. Sederoff M. Tierney R. Whetten	93-37103-9184	\$ 155,000	09/15/93- 03/31/96
Title: Extension-like Protein in the Wood Cell Wall				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Research Foundation of State University of New York Albany, NY 12201 Title: Cytological Aspects of Wood Decay and Preservation	R. Hanna S. Anagnost	93-37103-9183	\$ 84,000	09/01/93- 08/31/95
Research Foundation of State University of New York Albany, NY 12201 Title: The Nature and Impact of Lignin Condensation Reactions in Alkaline Delignification Processes	Y. Lai	93-37103-9318	\$ 80,000	09/15/93- 09/30/95
Oregon State University Corvallis, OR 97331 Title: Wood-Surface Feature Classification Using Physics-Based Vision	C. Brunner D. Butler A. Maristany	93-37103-9289	\$ 85,000	09/01/93- 08/31/95
Oregon State University Corvallis, OR 97331 Title: Oxidatively Coupled Polyphenols of Douglas-fir Bark: Molecular Structures and Reactions for Utilization	J. Karchesy	93-37103-9483	\$ 90,000	09/15/93- 09/30/95
Oregon State University Corvallis, OR 97331 Title: Dielectric Scanning for Defects on Wood Surfaces	J. Funck J. Westall	93-37103-9482	\$ 55,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
USDA/ARS North Atlantic Area Philadelphia, PA 19118 Title: Enhanced Yield and Extraction of Taxanes From Needles of Taxus (yew) Species	D. Gibson R. Ketchum	93-37103-9269	\$ 100,000	09/15/93- 09/30/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Fundamental Aspects of Lignin-Carbohydrate Covalent Interactions	R. Helm	93-37103-9324	\$ 80,000	09/15/93- 09/30/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Critical Review of Wood Drying Models	F. Kamke	93-37103-9185	\$ 24,198	09/01/93 10/31/94
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Effects of Design Parameters on Load Transfer in Multiple-Bolted Connections	A. Zink J. Loferski	93-37103-9321	\$ 65,000	09/15/93- 09/30/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Chemical and Morphological Characterization of the Wood-Isocyanate Interphase	C. Frazier	93-37103-9325	\$ 95,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Washington Seattle, WA 98195 Title: The Transverse Cylindrically Orthotropic Elastic Constants of Wood	J. Johnson	93-37103-9484	\$ 50,000	09/15/93- 09/30/95
Forest Products Laboratory USDA, Forest Service Madison, WI 53705 Title: Emission of Volatile Organic Chemicals from Wood Composites	A. Conner M. Baumann	93-37103-9268	\$ 110,000	09/15/93- 09/30/95
Forest Products Laboratory USDA, Forest Service Madison, WI 53705 Title: Optimum Air Velocities in Kiln Drying One Inch Thick Oak and Pine Lumber	W. Simpson	93-37103-9267	\$ 27,333	09/15/93 09/30/95
Forest Products Laboratory USDA, Forest Service Madison, WI 53705 Title: Oxidation of Lignin Structures by Polyoxometalates	I. Weinstock K. Hammel	93-37103-9270	\$ 130,000	09/15/93- 09/30/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Mechanisms of Strength Developments in Chemical Pulps	R. Young	93-37103-9322	\$ 110,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Util. of Wood & Wood Fiber

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Multi-knot Failure Mechanisms in Structural Lumber	S. Cramer	93-37103-9323	\$ 110,000	09/15/93- 09/30/95
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Measurement of Wood Topology and Adhesion by Scanning Probe Microscopy	D. Gardner L. Wilson	93-37103-9326	\$ 60,000	09/15/93- 09/30/95

Total : \$ 2,756,418

NUTRITION, FOOD QUALITY AND HEALTH

The health of the U.S. citizen depends on the quality and quantity of the country's food supply and the nutrients consumed by individuals. Research is supported which will contribute to the improvement of human nutritional status by increasing our understanding of requirements of nutrients and factors affecting optimal human nutrition. Grants are also awarded in the area of food safety, particularly focusing on the pathogenesis, prevention and control of food-borne disease-causing microorganisms.

NUTRITION, FOOD QUALITY AND HEALTH

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HUMAN NUTRIENT REQUIREMENTS FOR OPTIMAL HEALTH (HUMAN NUTRITION)

This program area places an emphasis on research which will increase our knowledge of human nutrient requirements and the factors which influence them. Areas of research which will be emphasized include: nutrient bioavailability, the interrelationship of nutrients, nutrient requirements of healthy individuals across all age groups, mechanisms underlying the relationship between diet and health maintenance (such as the effect of nutrients on the immune system) and cellular and molecular mechanisms underlying nutrient requirements, including nutrient effects on gene expression. In addition, this program emphasizes the area of food consumer behavior, including identifying and developing methods to overcome obstacles to adopting healthful food habits, to convey knowledge to target audiences, and to ascertain factors that affect food choice. Innovative approaches to these research problems are encouraged.

National Research Initiative Competitive Grants Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Berkeley, CA 94720 Title: Regulation of Zinc Homeostasis in Humans	J. King	93-37200-8814	\$ 200,000	09/01/93- 08/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Application of the Deuterated Retinol Dilution Techniques to Assess Vitamin A Requirements in Free-Living Populations	K. Brown A. Jones	93-37200-9382	\$ 150,000	09/15/93- 09/30/95
University of Connecticut Storrs, CT 06269-2086 Title: Essential Fatty Acids in Pregnancy and Lactation	C. Lammi-Keefe	93-37200-8876	\$ 180,000	08/01/93 07/31/96
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Macronutrients and Regulation of Neuropeptide Gene Expression	R. Martin	91-37200-6402	\$ 160,000	09/01/91- 08/31/95
University of Iowa Iowa City, IA 52242 Title: Carnitine Depletion in Vitamin C Deficiency and Food Restriction	C. Rebouche	93-37200-8877	\$ 100,000	08/01/93- 07/31/95

National Research Initiative Competitive Grants Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Carotenoid Absorption and Metabolism	J. Erdman W. Merchen	91-37200-6273	\$ 160,000	09/01/91- 08/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Conference on Mathematical Modelling in Nutrition; Vitamins, Proteins, Methods	D. Townsend S. Coburn	93-37200-8815	\$ 7,000	08/01/93- 07/31/94
Purdue University West Lafayette, IN 47907 Title: Retinol-Modulated Disulfide Alterations in Membrane Trafficking	D. Morre'	93-37200-9020	\$ 100,000	09/15/93- 09/30/95
Board of Supervisors Louisiana State University & A&M College Baton Rouge, LA 70803-3805 Title: Dietary Essential Fatty Acids and Cellular Expression of Prostaglandin H Synthase	D. Hwang	93-37200-8961	\$ 190,000	08/01/93- 07/31/96
Tufts University Boston, MA 02111 Title: Vitamin E Requirement of Elderly Consuming Fish-Derived (n-3) Fatty Acids	M. Meydani S. Meydani	93-37200-9066	\$ 129,718	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: Metabolism and Function of Retinoic Acid in Quail Embryogenesis	M. Zile	91-37200-6285	\$ 100,000	08/01/91-07/31/95
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Nutritional Copper Status and the Nervous System	J. Prohaska L. Drewes	93-37200-8756	\$ 200,000	09/01/93-08/31/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Effect of Maternal Fish Oil & Vitamin E Intake on Oxidation Susceptibility of Weaned Pups	P. Yan	93-37200-9489	\$ 55,210	09/15/93-09/30/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Role of Zinc in the Nervous System	B. O'Dell	91-37200-6286	\$ 150,000	08/01/91-07/31/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Infant Calcium Dynamics Using Oral ⁴⁴ Ca and IV ⁴⁶ Ca	L. Hillman	93-37200-8962	\$ 160,000	09/01/93-08/31/95

National Research Initiative Competitive Grants Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of North Carolina at Chapel Hill Chapel Hill, NC 27599-4100 Title: The Effect of Calcium Supplementation of Young Adult White Women on Bone Mass	J. Anderson	93-37200-9108	\$ 168,000	09/01/93-08/31/96
Research Foundation of the State University of New York Buffalo, NY 14260 Title: Intracellular Copper-Trafficking Proteins	M. Ettinger	93-37200-8977	\$ 90,138	09/01/93-08/31/95
Ohio State University Research Foundation Columbus, OH 43210 Title: Dietary Copper Restriction and Cardiomyopathy: Mechanism and Requirement Studies	D. Medeiros	93-37200-8757	\$ 200,000	07/01/93-06/30/96
Ohio State University Research Foundation Columbus, OH 43210 Title: Effect of Saturated Fatty Acids on LDL Synthesis and Degradation in Women	J. Snook	93-37200-8978	\$ 160,000	09/01/93-08/31/95
Oregon Health Sciences University Portland, OR 97201 Title: Lipid Responsiveness to Dietary Fat in Black and White Women	W. Connor	93-37200-8963	\$ 150,000	08/15/93-08/31/96

National Research Initiative Competitive Grants Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Dietary Folate Requirement of Lactating Women	M. Picciano	93-37200-8857	\$ 180,000	09/01/93-08/31/96
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Cellular Zinc Requirement for Gene Expression by Steroid Receptor Superfamily	G. Bunce P. Bender	93-37200-9168	\$ 70,282	09/01/93-08/31/95
Virginia Commonwealth University Richmond, VA 23298-0001 Title: Vitamin E Effects on Endothelial Function in Brain Blood Vessels in Vivo	W. Rosenblum	93-37200-9109	\$ 123,781	09/01/93-08/31/95
University of Vermont and State Agricultural College Burlington, VT 05405 Title: The Effect of Parental Smoking on the Quality of Low-Income Children's Diets	R. Johnson	93-37200-8758	\$ 41,081	08/01/93-07/31/94
Washington State University Pullman, WA 99164-5045 Title: Vitamin B-6 Requirements of Women and the Effect on Carnitine Metabolism	T. Shultz M. Mitchell	93-37200-8858	\$ 160,000	09/01/93-08/31/95

National Research Initiative Competitive Grants Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Iron Homeostasis and the Regulation of the IRE-BP in HL 60 Cells	K. Schalinske	93-37200-8816	\$ 70,000	07/01/93- 06/30/95
University of Wyoming Laramie, WY 82071 Title: Factors Related to Urinary Oxalate Excretion in Man	M. Liebman	93-37200-9403	\$ 150,000	09/15/93- 09/30/96

Total : \$ 3,605,210

NUTRITION, FOOD QUALITY AND HEALTH

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FOOD SAFETY

Safety of food products is of paramount importance to the producer, processor, distributor, and consumer. The research program in food safety focuses on research questions involving those bacteria responsible for food-borne illness in humans with an emphasis on microbial contaminants. Projects may focus either on pre- or post-harvest microbial contamination.

National Research Initiative Competitive Grants Program
Food Safety

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Mechanisms of Psychrotrophic Growth	B. Osburn R. Walsh	93-37201-9407	\$ 93,700	09/15/93- 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Regulation of Salmonella enteritidis Lipopolysaccharide Microheterogeneity	R. Carlson J. Petter	93-37201-9196	\$ 175,580	09/15/93- 09/30/96
Illinois State University Normal, IL 61761 Title: Molecular Stress Physiology of Listeria monocytogenes	B. Wilkinson	93-37201-9560	\$ 199,710	09/15/93 09/30/96
Purdue Research Foundation West Lafayette, IN 47907 Title: Molecular and Genetic Analysis of Broad-Spectrum Bacteriocins of Lactic Acid Bacteria	P. Muriana	93-37201-9330	\$ 185,328	09/15/93- 09/30/96
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Inhibition of Production of the Tumor-Promoting Mycotoxin Fumonisin B1	W. Shier	93-37201-9561	\$ 129,543	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Food Safety

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of North Carolina at Chapel Hill Chapel Hill, NC 27599-4100 Title: Phages and Gene Probes to Detect Human and Animal Fecal Contamination of Foods	M. Sobsey	93-37201-9193	\$ 119,260	09/15/93- 09/30/95
North Carolina State University Raleigh, NC 27695-7514 Title: Bioselective Adsorption of Microorganisms as a Processing Technology	P. Foegeding H. Swaisgood	93-37201-9190	\$ 119,311	09/15/93- 09/30/96
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Physiological Studies on <i>Listeria monocytogenes</i>	R. Hutkins T. Conway	93-37201-9291	\$ 95,436	09/01/93 08/31/95
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Control of Pathogenic Microorganism on Fresh Fruits and Vegetables	S. Sumner L. Bullerman J. Albrecht	93-37201-9406	\$ 102,972	09/15/93- 09/30/95
Trustees of the University of Pennsylvania Philadelphia, PA 19104 Title: Development of a Molecular Typing System for <i>Campylobacter</i>	I. Nachamkin	93-37201-9192	\$ 112,350	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Food Safety

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Control of Staphylococcus aureus Enterotoxin Formation in Mushroom Products	R. Beelman S. Doores	93-37201-9195	\$ 115,938	09/15/93- 09/30/95
University of Rhode Island Kingston, RI 02881 Title: Immunomicrobial Biosensors for Detection of Salmonella in Foods	A. Rand S. Letcher C. Brown	93-37201-9197	\$ 179,942	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Foodservice Preparation Effects on Heat Resistance of Escherichia coli O157:H7	G. Acuff	93-37201-9404	\$ 23,976	09/15/93 09/30/94
Texas A&M Research Foundation College Station, TX 77843 Title: Regulation of Toxin Production by Food Contaminating Fungi	N. Keller T. Adams	93-37201-9405	\$ 160,424	09/15/93- 09/30/95
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Improved Detection of Sublethally Injured Listeria in Foods	C. Donnelly	93-37201-9191	\$ 150,234	09/01/93- 08/31/96

National Research Initiative Competitive Grants Program
Food Safety

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Diarrheagenic Bacillus cereus: Enterotoxins and Diagnostic Methods	A. Wong D. Beecher	93-37201-9194	\$ 183,896	09/15/93- 09/30/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Recognition of Virulent Listeria in Refrigerated Meats	J. Luchansky	91-37201-6762	\$ 131,856	09/01/91- 08/31/95

Total : \$ 2,279,456

ANIMAL SYSTEMS

Research across a broad range of animal systems areas is urgently needed for the future enhancement of animal production efficiency as well as to address such areas as the modification of animal products. To accomplish this, grants are awarded in four broad areas of research: (1) animal reproductive biology, (2) cellular growth and developmental biology of animals, (3) animal molecular genetics and gene mapping, and (4) mechanisms of animal disease.

ANIMAL SYSTEMS

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REPRODUCTIVE BIOLOGY OF ANIMALS

The primary objective of this program area is to increase our knowledge of reproductive biology in agriculturally important animals with the goal of increasing reproductive efficiency. This program will consider for support innovative research on: (1) mechanisms affecting embryo survival, endocrinological control of embryo development, mechanisms of embryo-maternal interactions, embryo-implantation, and development of optimal embryo culture methods, (2) factors controlling ovarian function including follicular development ovulation, and corpus luteum formation and function, (3) factors controlling male reproductive function, (4) gamete physiology, including oogenesis and spermatogenesis, gamete maturation, mechanism regulating gamete survival in vivo or in vitro, and (5) parturition, postpartum interval to conception, and neonatal survival. This program also encourages research on the mechanisms controlling animal responses to physical and biological stresses that impinge upon reproductive efficiency.

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Alabama Birmingham, AL 35294-2010 Title: Molecular Regulatory Mechanisms of LH Secretion in Cattle	J. Neill C. Rahe S. Kakar	93-37203-9067	\$ 262,000	09/15/93- 09/30/96
University of Arizona Tucson, AZ 85721 Title: Regulation of GnRH Secretion During Sexual Maturation	M. Wise	93-37203-8964	\$ 200,000	09/01/93- 08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Physiologic Basis for Genetic Difference in Ovulation Rate	T. Adams	93-37203-9111	\$ 170,000	09/01/93- 08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Characterization of the Sperm Acrosomal Filament in the Penaeoidean Shrimp <i>Sicyonia ingentis</i>	W. Clark L. Lindsay	93-37203-9110	\$ 271,000	09/01/93- 08/31/96
University of Florida Gainesville, FL 32611 Title: Mechanisms Governing Movement of Sperm in the Oviduct	S. Suarez P. Chenoweth	93-37203-9112	\$ 177,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011 Title: Relaxin Effects on Central Nervous System Regulation of Prolactin Secretion in Pigs	L. Anderson C. Jacobson	93-37203-8965	\$ 190,000	09/15/93- 09/30/96
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Epididymal Region of the Rooster: Production and Target Site for Estrogen	J. Bahr D. Bunick R. Hess	93-37203-9021	\$ 219,000	09/01/93- 08/31/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Mechanism Whereby Relaxin Initiates Its Effect on the Cervix in Pregnant Pigs	O. Sherwood	93-37203-9562	\$ 100,000	09/15/93 09/30/96
Methodist Hospital of Indiana, Inc. Indianapolis, IN 46202 Title: Fundamental Cryobiology of Boar Spermatozoa	J. Critser A. Peter	93-37203-9272	\$ 92,000	09/15/93- 09/30/95
The Board of Regents of the University of Michigan Ann Arbor, MI 48109-1248 Title: Photoperiodism and Puberty in Male and Female Sheep	D. Foster	93-37203-9292	\$ 190,000	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: The Biology of Seminal Sephadex Binding Proteins in Swine	B. Crabo D. Foster D. Hamilton	91-37203-6610	\$ 89,000	09/01/91- 08/31/94
The Curators of the University of Missouri Columbia, MO 65211 Title: Cytoplasmic Maturation of Oocytes and Development of Porcine Embryos Produced in Vitro	B. Day	93-37203-9186	\$ 120,000	09/15/93- 09/30/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Intrafollicular Control of Ovarian Follicular Recruitment, Selection and Atresia in Cattle	H. Garverick R. Youngquist	93-37203-9331	\$ 219,000	09/15/93 09/30/96
Duke University Medical Center Durham, NC 27710 Title: Growth Inhibitory Factors in the Porcine Ovarian Follicle	D. Schomberg	93-37203-9610	\$ 227,000	09/15/93- 09/30/96
North Carolina State University Raleigh, NC 27695-7003 Title: Nutritional Factors Modulating Ovarian Function in Ruminants	J. Armstrong C. Farin R. Harvey	93-37203-9163	\$ 232,000	09/01/93- 08/31/96

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Role of Angiogenic Factors in Ovarian Function	D. Redmer L. Reynolds	93-37203-9271	\$ 200,000	09/01/93- 08/31/96
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Ovarian Follicular Development in Prepubertal Heifers: Role of LH, FSH and Estradiol	J. Kinder M. Garcia-Winder	93-37203-9068	\$ 145,000	09/01/93- 08/31/96
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Regulated Expression of the GnRH Gene in Ruminants	D. Hamernik	93-37203-9490	\$ 126,000	09/15/93 09/30/95
Rutgers, The State University Piscataway, NJ 08855-1089 Title: Intraovarian Role of Relaxin in Follicular Development	C. Bagnell	93-37203-8979	\$ 236,000	08/15/93- 08/31/96
Cornell University Ithaca, NY 14853 Title: Ovarian Follicular Development in Cattle: Effects of Luteolysis and the LH Surge	J. Fortune	93-37203-9022	\$ 280,000	09/01/93- 08/31/96

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Langston University Langston, OK 73050 Title: National Symposium on Goat Fiber Production, Processing and Marketing	T. Teh	93-37500-8915**	\$ 2,500	08/01/93- 01/31/94
Agricultural Expt. Station Oklahoma State University Stillwater, OK 74078 Title: Role of Insulin-like Growth Factor-1 and Its Receptor in Ovarian Follicular Function	L. Spicer	93-37203-9023	\$ 130,000	09/01/93- 08/31/96
Pennsylvania State University University Park, PA 16802-1003 Title: Male Factor Affecting Fertility of Bovine Sperm	G. Killian	93-37203-9069	\$ 212,000	09/01/93 08/31/96
Pennsylvania State University University Park, PA 16802-1003 Title: Surface Components Essential to Sperm-Egg Binding	R. Hammerstedt G. Barbato	92-37203-8106	\$ 294,000	09/15/92- 09/30/96
Clemson University Clemson, SC 29634-5326 Title: Origin of Turkey Spermiphages and Their Effects on Semen Quality	R. Thurston T. Scott	93-37203-9408	\$ 75,000	09/15/93- 09/30/96

** Split Funded Award

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agricultural Expt. Station University of Tennessee Knoxville, TN 37901-1071 Title: Retinoid Binding Proteins and Receptors in Bovine Placental Development	J. Godkin	93-37203-8980	\$ 212,000	09/01/93-08/31/96
University of Texas Southwestern Medical Center at Dallas Dallas, TX 75235-9073 Title: Pig Sperm Surface Proteins that Interact Specifically with the Zona Pellucida	D. Garbers	93-37203-9024	\$ 237,000	09/01/93-08/31/96
Washington State University Pullman, WA 99164-5045 Title: Regulation of Uterine Prostaglandin F2 Alpha Secretion in Cyclic and Early Pregnant Swine	M. Mirando	93-37203-9070	\$ 153,000	09/01/93-08/31/96
Northwest Fisheries Sci. Ctr. National Marine Fisheries Service, U.S. Dept. of Commerce Seattle, WA 98112 Title: Regulation of Fish Reproduction: Gonadotropins and Their Receptors	P. Swanson	93-37203-9409	\$ 222,000	09/15/93-09/30/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Paternal Regulation of the Bovine Zygotic Cell Cycle	J. Parrish	93-37203-9072	\$ 154,000	09/15/93-09/30/96

National Research Initiative Competitive Grants Program
Reproductive Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Microtubule Dynamics and Centrosome Inheritance During Bovine Fertilization	G. Schatten	93-37203-9071	\$ 217,000	09/01/93- 08/31/96

Total : \$ 5,653,500

ANIMAL SYSTEMS

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CELLULAR GROWTH AND DEVELOPMENTAL BIOLOGY OF ANIMALS

Research in this program area contributes to our understanding of the biological mechanisms underlying growth and development in agriculturally important animals. Emphasis is placed on innovative approaches in several research areas including, but not limited to: cell proliferation and differentiation, genetic mechanisms underlying growth and development, metabolic regulators such as growth factors, synthesis and degradation of protein and lipid at the cellular or tissue level, metabolic and nutritional aspects of growth and development including rumen microfloral development, developmental biology of the immune system, and cellular and molecular aspects of the effect of environmental stress on growth and development.

National Research Initiative Competitive Grants Program
Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Alaska Fairbanks, AK 99775 Title: Genetics of Pink Salmon Growth	P. Crandell	93-37206-9120	\$ 100,000	09/15/93- 09/30/95
University of Colorado Health Sciences Center Denver, CO 80262 Title: Regulation of Lipoprotein Metabolism in the Mammary Gland	M. Neville S. Gavigan	93-37206-9346	\$ 263,000	09/15/93- 09/30/96
Wesleyan University Middletown, CT 06457 Title: Regulation of the $\alpha 2(I)$ Collagen Gene in Cartilage Cells by Shifting the RNA Start Site	L. Lukens	93-37206-9495**	\$ 150,000	09/15/93 09/30/96
University of Connecticut Storrs, CT 06269-2086 Title: Growth Hormone Response to GRF and SRIF in Dairy Sires of Differing Genetic Merit	G. Kazmer S. Zinn	93-37206-9496	\$ 100,000	09/15/93- 09/30/95
University of Iowa Iowa City, IA 52242 Title: Regulation of Transcription of the Avian Gene for Fatty Acid Synthase	A. Goodridge	93-37206-9353	\$ 240,000	09/15/93- 09/30/96

** Split Funded Award

National Research Initiative Competitive Grants Program
Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
USDA/ARS Mid-West Area Peoria, IL 61604 Title: Competition and Cooperation Among Ruminal Cellulolytic Bacteria	P. Weimer	93-37206-9221	\$ 95,000	09/15/93-09/30/96
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Biochemistry and Genetics of Enzymes of Ammonia Assimilation in Ruminococcus	R. Mackie B. White	93-37206-9350	\$ 133,116	09/15/93-09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Model Rumens to Evaluate Response to System Changes and Added Microorganisms	D. Stahl T. Whithead M. Cotta	93-37206-9349	\$ 160,000	09/15/93-09/30/95
Kansas State University Manhattan, KS 66506 Title: Development and Regulation of Porcine Neonatal Neutrophil Function	F. Blecha	93-37206-9351	\$ 200,000	09/15/93-09/30/96
Massachusetts General Hospital Boston, MA 02114 Title: Poultry Muscle Development: Molecular and Cellular Biology	J. Miller	93-37206-9121	\$ 250,000	09/01/93-08/31/96

National Research Initiative Competitive Grants Program
 Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: Regulation of Fatty Acid Synthase by Ractopamine in TA1 Cells and Pig Adipose	W. Bergen	93-37206-9122	\$ 125,000	09/01/93-08/31/95
Michigan State University East Lansing, MI 48824 Title: Aminergic Regulation of Growth Hormone Secretion in Cattle	H. Tucker K. Lookingland	93-37206-9347	\$ 230,000	09/15/93-09/30/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Insulin-like Growth Factor II Expression in Developing Bovine Muscle	D. Gerrard	93-37206-9352	\$ 75,000	09/15/93-09/30/95
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: Ontogeny of the Channel Catfish, <i>Ictalurus punctatus</i> , Immune Response	A. Ainsworth	93-37206-9566	\$ 150,000	09/15/93-09/30/96
Montana State University Bozeman, MT 59717 Title: Molecular Basis for the Unique Trafficking of g/d T Cells in Ruminants	M. Jutila	93-37206-9348	\$ 240,000	09/15/93-09/30/96

National Research Initiative Competitive Grants Program
Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of North Carolina at Chapel Hill Chapel Hill, NC 27599-4100 Title: Role of IGFs in Bovine Mammary Epithelial Cell Growth and Differentiation	W. Cohick	93-37206-9355	\$ 145,000	09/15/93-09/30/96
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Cellular Proliferation and Differentiation of the Early Porcine Conceptus	A. Conley S. Ford	93-37206-9273	\$ 105,000	09/01/93-08/31/96
Research Foundation of State University of New York Albany, NY 12201 Title: Integrin Function in Growth Cones of Sympathetic Neurons	D. Turner	93-37206-9274	\$ 185,000	09/15/93-09/30/96
Roswell Park Division and New York State Dept. of Health Buffalo, NY 14263 Title: Regulation of Cell Proliferation and Differentiation Mediated by TGFB Family and pRb	C. Wenner A. Kinniburgh	93-37206-9275	\$ 132,500	09/15/93-09/30/95
Cornell University Ithaca, NY 14853 Title: Nutritional Regulation of IGF and IGF Binding Proteins	D. Bauman R. Boyd	93-37206-9025	\$ 200,000	09/01/93-08/31/96

National Research Initiative Competitive Grants Program
 Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: IV International Symposium on Milk Hormones	C. Grosvenor	93-37206-9383	\$ 9,000	09/15/93-09/30/94
Pennsylvania State University University Park, PA 16802-1003 Title: Bioactivity of Growth Hormone Variants in Cattle	D. Deaver T. Etherton	93-37206-9414	\$ 100,000	09/15/93-09/30/95
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Gordon Research Conference on Mammary Gland Biology	H. Farrell	93-37206-8686	\$ 10,000	06/01/93-05/31/94
Texas A&M Research Foundation College Station, TX 77843 Title: Characterization of Bovine T Cell Subsets by Cytokine Production	W. Brown	93-37206-9075	\$ 260,000	09/01/93-08/31/96
USDA/ARS Southern Plains Area College Station, TX 77840 Title: Genetic Control of Porcine Adipocyte Hypertrophy at Critical Stages of Adipose Tissue Growth	H. Mersmann	93-37206-9220	\$ 100,000	09/01/93-08/31/95

National Research Initiative Competitive Grants Program
 Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Effects of Insulin-like Growth Factor-I Transgenes on Bovine Mammary Cell Growth and Differentiation	R. Akers E. Wong	93-37206-9354	\$ 97,500	09/15/93- 09/30/95
University of Washington Seattle, WA 98195 Title: Retrovirally-mediated Overexpression of IGF Receptors and IGF-BPs in Myoblasts	L. Quinn	93-37206-9218	\$ 220,000	09/01/93- 08/31/96
University of Washington Seattle, WA 98195 Title: Role of PDGF in Regulating Proliferation of Skeletal Muscle Satellite Cells	Z. Reuveni	93-37206-9301	\$ 260,000	09/15/93 09/30/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Myofibril Assembly in Mammalian Skeletal Muscle	M. Greaser	91-37206-6743	\$ 160,000	09/01/91- 08/31/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Mechanisms of Fasting-induced Hypersecretion in Piglet Intestine	H. Carey	93-37206-9222	\$ 210,000	09/01/93- 08/31/96

National Research Initiative Competitive Grants Program
Cellular Growth - Developmental Biology of Animals

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Cell-Specific Regulation of the Nuclear T3 Receptor	F. Hillgartner	93-37206-9219	\$ 250,000	09/01/93- 08/31/96

Total : \$ 4,955,116

ANIMAL SYSTEMS

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ANIMAL MOLECULAR GENETICS AND GENE MAPPING

The objective of this program is to increase our knowledge and understanding of the structure, organization, function, regulation and expression of genes in agriculturally important animals including aquaculture species. This includes but is not limited to: gene mapping and the identification, isolation, characterization of genes, gene products and their regulatory mechanisms, identification and mapping of DNA segregation markers including quantitative trait loci (QTL) and variable number tandem repeats (VNTR), interactions between nuclear and organellar genes and the molecular basis of genetic replication, and development and application of methods to modify the animal genome.

National Research Initiative Competitive Grants Program
Animal Molecular Genetics and Gene Mapping

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Improvement of Growth by Expression rtGH and Selection in Transgenic Catfish	R. Dunham	93-37205-9073	\$ 230,144	09/15/93-09/30/96
University of Florida Gainesville, FL 32611 Title: Control of Endometrial Expression of the Porcine IGFBP-2 Gene	F. Simmen R. Simmen	93-37205-9172	\$ 119,796	09/15/93-09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: International Conference on Comparative Gene Mapping (CGTAV)	H. Lewin	93-37205-9118	\$ 5,000	09/01/93-08/31/94
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Towards a 20 cM Map of the Bovine Genome	H. Lewin	91-37205-6335++	\$ 124,076	09/01/91-08/31/94
University of Massachusetts Amherst, MA 01003 Title: Physical Mapping of the Bovine Genome	F. Ponce de Leon J. Robl	93-37205-9565	\$ 220,913	09/15/93-09/30/96

++ Continuation Award

National Research Initiative Competitive Grants Program
Animal Molecular Genetics and Gene Mapping

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Production and Use of a Swine Chromosome 6 Genomic Library	J. Lunney	93-37205-9119	\$ 222,220	09/01/93- 08/31/95
Advanced Bioscience Labs, Inc. NCI - Frederick Cancer Research Facilities Frederick, MD 21701-1013 Title: Establishment of Totipotent Cells from Postimplantation Embryos	J. Resnick P. Donovan	93-37205-9074	\$ 154,084	09/15/93- 09/30/96
Michigan State University East Lansing, MI 48824 Title: Genetic and Physical Maps of the Chicken Genome	J. Dodgson L. Crittenden	93-37205-9344	\$ 134,038	09/15/93 09/30/95
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Mapping Major Genes for Growth and Reproductive Traits in Swine	L. Schook M. Wheeler	93-37205-9345	\$ 317,068	09/15/93- 09/30/96
Texas A&M Research Foundation College Station, TX 77843 Title: Isolation and Characterization of Embryonic Stem (ES) Cells from Bovine Embryos	J. Piedrahita	93-37205-9217	\$ 65,031	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Animal Molecular Genetics and Gene Mapping

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Baylor College of Medicine Houston, TX 77030 Title: Identification of DNA Sequences Required to Target Proteins to the Mammary Gland	J. Rosen	92-37205-8263++	\$ 100,000	09/15/92-09/30/94
University of Texas M.D. Anderson Cancer Center Houston, TX 77030 Title: Genetic Linkage Maps of Aquacultured Catfishes	D. Morizot	93-37205-9413	\$ 212,209	09/15/93-09/30/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Mapping Bovine Anchor Loci - Expanding the Comparative Linkage Map	B. Kirkpatrick	93-37205-9173	\$ 160,452	09/01/93-08/31/96
University of Wisconsin Milwaukee, WI 53201 Title: Isolation and Characterization of the Sex-determining Region of Salmonid Fishes	K. Reed	93-37205-9171	\$ 74,692	09/01/93-08/31/95

Total : \$ 2,139,723

++ Continuation Award

ANIMAL SYSTEMS

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MECHANISMS OF ANIMAL DISEASE

In order to sustain animal health and well-being and to prevent animal disease, the primary objective of this program area is to increase our understanding of pathogenesis and disease prevention. This includes, but is not limited to: mechanisms that alter the normal physiologic state at the molecular, cellular or organ level to produce disease resulting from both biotic and abiotic causes; genetic and cellular mechanisms of disease resistance (eg. molecular immunology and immunogenetics); host and microbial factors influencing colonization of mucosal surfaces; and host-environment interactions that compromise the host defense systems or cause predisposition to disease. Epidemiologic studies on animal diseases that provide insight into etiologic factors and/or control, basic research that would support the development of diagnostic tests and immunizations for emerging or reemerging diseases such as tuberculosis, and studies on economic models which address the costs of animal disease and the cost/benefit ratio of animal disease prevention and therapy are also considered. The program also encourages research on the mechanisms controlling animal responses to physical or biological stress and the development of objective indicators of animal health and well-being or attempts to more clearly define the condition of the well-being of animals.

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Cloning of Genes Encoding Adhesin(s) and Agglutinating Antigen(s) of <i>M. gallisepticum</i>	V. Panangala V. van Santen	93-37204-9113	\$ 90,105	09/01/93- 08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Spatial Epidemiology of Fowl Cholera in Turkeys	T. Carpenter K. Snipes	93-37204-9411	\$ 99,207	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: In vitro Characteristics of the Infection of Salmonid Lymphocytes with the Microsporidium <i>Enterocytozoon salmonis</i>	R. Hedrick	93-37204-9342	\$ 121,000	09/15/93 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Characterization of a Hemolysin from <i>Haemophilus sommus</i>	S. Cole	93-37204-9215	\$ 197,000	09/15/93- 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Plasmid Mediated Virulence of <i>Salmonella dublin</i> Infection in Cattle	D. Guiney	93-37204-9602	\$ 235,000	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Rough Brucella as a Live Vaccine Strain for Expression of Foreign Antigen Genes	L. Corbeil	93-37204-9332	\$ 230,000	09/15/93- 09/30/96
Palo Alto Medical Fdn. for Health Care, Research & Education Palo Alto, CA 94301 Title: Protective Potential of Bradyzoite-specific Antigens of T.gondii	S. Parmley Y. Suzuki J. Remington	91-37204-6878	\$ 200,000	09/15/91- 09/30/95
Stanford Univerity Stanford, CA 94305-4125 Title: The Genetic Immunization of Salmonid Fish	R. Levine	93-37204-9564	\$ 90,215	09/15/93 09/30/95
USDA/ARS Northern Plains Area Fort Collins, CO 80525 Title: Molecular Biology of Culicoides variipennis Vector Competence for Arboviruses	W. Tabachnick K. Murphy	93-37204-9156	\$ 184,065	09/01/93- 08/31/96
University of Connecticut Storrs, CT 06269-2086 Title: Vesicular Stomatitis: The Virus, The Interferon System, and the Disease	P. Marcus M. Sekellick J. Lucas-Lenard	93-37204-9335	\$ 174,999	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Delaware Newark, DE 19716 Title: Characterization of a Putative Mycoplasma gallisepticum Cytadhesin	J. Dohms	93-37204-9114	\$ 110,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Antigenic Variation by Babesia bovis in Establishment of Chronic Infection	D. Allred	93-37204-9115	\$ 148,000	09/15/93- 09/30/96
Tampa Bay Research Institute St. Petersburg, FL 33716 Title: Marek's Disease Virus: Analysis of Latency Associated Genes	A. Tanaka	93-37204-9337	\$ 232,558	09/15/93 09/30/96
USDA/ARS South Atlantic Area Athens, GA 30613 Title: Fumonisin Alterations in Receptor-Mediated Regulation of Physiological Processes	S. Leggette R. Riley	93-37204-9199	\$ 100,000	09/15/93- 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Immunologic Modulation of Fescue Toxicosis	F. Thompson N. Hill J. Stuedemann D. Dawe	93-37204-9207	\$ 250,000	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Emory University Atlanta, GA 30322 Title: Molecular Mechanism of Carcinogenesis Associated with Consumption of Fumonisin	J. Schroeder A. Merrill	93-37204-9339	\$ 78,527	09/15/93- 09/30/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Will Exogenous Glucagon Prevent Fatty Liver and Ketosis in Dairy Cows?	J. Young G. Lindberg D. Beitz	93-37204-9343	\$ 180,000	09/15/93- 09/30/96
USDA/ARS Mid-West Area Peoria, IL 61604 Title: Milk Fever Risk Factors: Dietary Cation-Anion Difference	J. Goff R. Horst	93-37204-9334	\$ 80,000	09/15/93 09/30/96
USDA/ARS Mid-West Area Peoria, IL 61604 Title: MDV Transformation: Functional Analysis of an MDV Putative Oncogene	L. Lee H. Kung R. Witter	93-37204-9340	\$ 193,481	09/15/93- 08/31/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Virulence Factors of Enterotoxigenic Escherichia coli	R. Isaacson	93-37204-9336	\$ 240,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: An Enterocyte Receptor for Porcine Rotavirus: Structure and Therapeutic Efficacy	M. Kuhlenschmidt H. Gelberg	93-37204-9563	\$ 180,925	09/15/93- 09/30/96
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Genetic and Mechanistic Analysis of Equine M(khi) Antiviral Gene	T. Chambers E. Bailey	93-37204-9341	\$ 195,198	09/15/93- 09/30/96
University of Massachusetts Amherst, MA 01003 Title: Analysis of Protective Immunity to Brucella abortus	C. Baldwin	93-37204-9494	\$ 190,252	09/15/93 09/30/96
University of Massachusetts Worcester, MA 01605 Title: Use of Hemagglutinin-Expressing DNAs to Vaccinate Chickens for Influenza Virus	H. Robinson	93-37204-9116	\$ 248,063	09/01/93- 08/31/96
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Hormonal Modulation of Physiological Responses of Calves to Parasitism	T. Elsasser J. Sartin B. Blagburn R. Fayer	93-37204-9410	\$ 130,000	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maryland College Park, MD 20742 Title: Social Behavior, Stress and Well-Being in Laying Hens	J. Mench	93-37204-9333	\$ 121,000	09/15/93-09/30/96
American Society of Tropical Veterinary Medicine Laurel, MD 20707 Title: Request for Funding for ASTVM-93, Symposium on Heartwater Disease	K. Kocan	93-37204-8356	\$ 5,000	02/01/93-01/31/94
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Impact of Disease on Morbidity, Mortality and Carcass Characteristics of Growing Swine	W. Marsh G. Dial P. Davies	93-37204-9208	\$ 215,000	09/15/93-09/30/96
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Anti-Cytokine Therapy for Prevention and Treatment of Respiratory Disease	M. Murtaugh M. Baarsch	93-37204-9338	\$ 182,000	09/15/93-09/30/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Immunoglobulin Isotype Regulation in the Bovine: Role of T Cell Derived Cytokines	D. Estes	93-37204-9601	\$ 200,000	09/15/93-09/30/96

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: An Epidemiologic Study of Proliferative Gill Disease in Channel Catfish	L. Pote	93-37204-9117	\$ 98,360	09/15/93- 09/30/96
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Molecular Mechanism of Cytopathogenicity of Bovine Viral Diarrhea Virus	F. Qi E. Berry	93-37204-9212	\$ 149,619	09/01/93- 08/31/95
Cornell University Ithaca, NY 14853 Title: Pathogenesis of Retroviral Diseases in Fish	P. Bowser J. Casey	93-37204-9214	\$ 160,331	09/01/93 08/31/95
Cornell University Ithaca, NY 14853 Title: Bovine Leukemia Virus Tumorigenesis in the SCID Mouse	J. Casey	93-37204-9213	\$ 177,680	09/01/93- 08/31/96
Ohio State University Research Foundation Columbus, OH 43210 Title: Induced Lactogenic Immunity in Cows by Rotavirus Proteins or Viruslike Particles	L. Saif K. Smith	93-37204-9201	\$ 264,933	09/01/93- 08/31/96

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agricultural Expt. Station Oklahoma State University Stillwater, OK 74078 Title: Control of Virulence in an Intracellular Pathogen	R. Essenberg	93-37204-9210	\$ 179,000	09/01/93-08/31/96
Oregon State University Corvallis, OR 97331 Title: Functional Analysis of Proteasome Gene Expression	N. Forsberg	93-37204-9294	\$ 84,483	09/15/93-09/30/95
Trustees of the University of Pennsylvania Philadelphia, PA 19104 Title: Development of Bovine Herpesvirus 1 as a Vector for Expression of Foreign Genes	W. Lawrence L. Bello	93-37204-9203	\$ 256,977	09/15/93-09/30/95
Pennsylvania State University University Park, PA 16802-1003 Title: Mechanisms of Cytokine-Mediated Mammary Immune Cell Regulation	L. Sordillo	93-37204-9206	\$ 100,000	09/01/93-08/31/95
University of Tennessee Knoxville, TN 37996-0140 Title: Significance of Strain Variation Within the Ruminant Respiratory Syncytial Viruses	L. Potgieter	93-37204-9211	\$ 123,310	09/01/93-08/31/95

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agricultural Expt. Station University of Tennessee Knoxville, TN 37901-1071 Title: Purification and Characterization of Bovine Lipopolysaccharide Binding Protein	P. Bochsler	93-37204-9200	\$ 184,000	09/01/93- 08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Effect of in utero Maternal Stress on the Calf's Response to Later Stressors	T. Friend R. Randel	93-37204-9293	\$ 145,000	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Ascites Syndrome in the Broiler Chicken: Cellular and Hemodynamic Implications	T. Odom J. Jeffrey	93-37204-9299	\$ 91,000	09/01/93 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: RNA Recombination: A Mechanism for the Evolution of New IBV Strains	E. Collisson	93-37204-9296	\$ 165,560	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: T Cell Responses to Tegument Antigens of Fasciola hepatica	A. Ficht	93-37204-9492	\$ 260,000	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas A&M Research Foundation College Station, TX 77843 Title: Genetic Resistance to Bovine Brucellosis, Tuberculosis, and Salmonellosis	J. Templeton L. Adams	93-37204-9491	\$ 190,748	09/15/93- 09/30/95
Agricultural Expt. Station Texas A&M University System College Station, TX 77843 Title: Induction by Recombinant Antigens of Functional Immunity to the Enteric Pathogen <i>Trichinella spiralis</i>	P. Lyons	93-37204-9493	\$ 152,306	09/15/93- 09/30/95
Baylor College of Medicine Houston, TX 77030 Title: Regulation of <i>Pasteurella haemolytica</i> Leukotoxin Expression	S. Highlander	93-37204-9295	\$ 270,000	09/15/93 09/30/96
Texas Tech University Health Sciences Ctr. Lubbock, TX 79430 Title: Investigation of Feeding Motivation as a Cause of Stereotyped Behavior in Gilts	J. McGlone R. Norman	93-37204-9412	\$ 215,000	09/15/93- 09/30/96
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Interactions Between Bovine Epithelial Cells and Mastitis Pathogens	A. Bramley I. Politis B. Zavizion	93-37204-9216	\$ 100,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Washington State University Pullman, WA 99164-5045	S. Ristow S. LaPatra T. Baldwin	93-37204-9297	\$ 165,003	09/01/93- 08/31/96
Title: Induction and Evaluation of Mucosal Immunity in Trout Vaccinated with IHNV Antigens				
Washington State University Pullman, WA 99164-5045	S. Hines L. Perry S. Kanaly	93-37204-9298	\$ 138,000	09/01/93- 08/31/95
Title: Rhodococcus equi pneumonia: Mechanisms of Immune Clearance				
Washington State University Pullman, WA 99164-5045	C. Wyatt L. Perryman	93-37204-9300	\$ 253,000	09/15/93 09/30/96
Title: Mechanism of Intestinal Lesion Development in Bovine Cryptosporidiosis				
Board of Regents of the University of Wisconsin System Madison, WI 53706	L. Armentano R. Grummer	93-37204-9202	\$ 76,837	09/15/93- 09/30/95
Title: Effect of Intra-Hepatocyte Triglyceride Accumulation on Specific Hepatic Functions in the Bovine				
Board of Regents of the University of Wisconsin System Madison, WI 53706	G. Splitter	93-37204-9205	\$ 213,764	09/01/93- 08/31/96
Title: Immunological Rationale for a BHV-1 Peptide Vaccine				

National Research Initiative Competitive Grants Program
Mechanisms of Animal Disease

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Bovine IL-1 Receptors: Regulation, Signal Transduction, and Molecular Cloning	C. Czuprynski L. Schuler	93-37204-9204	\$ 275,000	09/01/93- 08/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Role of Bovine T Cells in the Pathogenesis of Mycobacterial Infections	M. Collins C. Czuprynski	93-37204-9198	\$ 235,000	09/15/93- 09/30/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Genetic Organization and Regulation in Leptospira interrogans	D. Yelton	93-37204-9209	\$ 100,000	09/01/93 08/31/95

Total : \$ 9,726,506

PLANT SYSTEMS

Research in the area of Plant Systems addresses fundamental and mission-oriented research needed to improve and sustain plant production systems and for conservation and proper utilization of naturally occurring plant communities. Grants are awarded under eight programs: Plant Genetic Mechanisms and Molecular Biology, Plant Growth and Development, Photosynthesis and Respiration, Nitrogen Fixation/Metabolism, Plant Pathology/Weed Science, Entomology/Nematology, Alcohol Fuels, and Plant Genome.

PLANT SYSTEMS

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PLANT GENETIC MECHANISMS & MOLECULAR BIOLOGY

This program area supports studies addressing the basic cellular, molecular and genetic processes which contribute new information required for the development of novel approaches to crop and forest improvement. Innovative research is emphasized in the following areas: (1) characterization of agriculturally important genes and gene products, (2) relationship between gene structure and function, (3) regulatory mechanisms of gene expression, (4) interactions between nuclear and organellar genomes, (5) mechanisms of recombination, transposition, replication, and repair (6) processes controlling regeneration of whole plants from single cells, and (7) alteration and use of germplasm resources.

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Alabama Tuscaloosa, AL 35487-0104 Title: A Novel Mechanism for Ribosomal Protein Modulation:	K. Redman M. Johnson On/Off Splicing	93-37301-8942	\$ 120,000	08/15/93- 08/31/95
Individual Awardee Benicia, CA 94510 Title: Regulation of Glandular Trichome-based Insect Resistance in Lycopersicon	S. Colby	93-37301-9504	\$ 82,000	09/15/93- 09/30/95
The Regents of the University of California Berkeley, CA 94720 Title: Mechanism of Shoot Determination and Floral Transition in Arabidopsis	Z. Sung	93-37301-8704	\$ 120,000	08/01/93 07/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Transposon Mutagenesis in Tomato	J. Yoder	93-37301-9430	\$ 118,500	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: Molecular and Cellular Analysis of Vascular Function Using a Phloem-Limited Virus	R. Gilbertson W. Lucas	93-37301-9304	\$ 118,500	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Riverside, CA 92521 Title: Molecular and Cell Biology of Oil Bodies in Maize and Brassica	A. Huang	91-37301-6370++	\$ 67,000	08/01/91- 07/31/94
The Regents of the University of California Riverside, CA 92521 Title: Isolation of RNA-Binding Proteins Involved in Regulating Translation	D. Gallie	93-37301-9124	\$ 70,000	09/01/93- 08/31/94
Salk Institute for Biological Studies San Diego, CA 92186-5800 Title: Molecular and Genetic Analysis of Arabidopsis DET2 Gene	J. Chory	93-37301-9125	\$ 210,000	09/01/93 08/31/96
Carnegie Institution of Washington Washington, DC 20005 Title: The Use of Cyanobacteria to Explore Basic Biological Processes -- 1993 Workshop	A. Grossman	93-37301-8609	\$ 5,000	06/01/93- 05/31/94
University of Florida Gainesville, FL 32611 Title: Chromatin Structure and Gene Expression in Plant	R. Ferl	91-37301-6372++	\$ 73,000	09/01/91- 08/31/94

++ Continuation Award

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Florida Gainesville, FL 32611 Title: Molecular and Physiological Genetics of Sucrose Metabolizing Enzymes in Maize Endosperm	G. Agrios P. Chourey	91-37301-6343	\$ 120,000	08/15/91- 08/31/95
University of Florida Gainesville, FL 32611 Title: Viviparous-1 Mediated Repression of Alpha Amylase Genes in Developing aleurone	D. McCarty I. Vasil	93-37301-9357	\$ 210,000	09/15/93- 09/30/96
Florida State University Tallahassee, FL 32306 Title: Targeting of DNA Integration to Specific Sites in Plant Chromosomes	G. Bates	93-37301-9569	\$ 115,000	09/15/93 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Phytochrome Gene Family in Tomato	L. Pratt M. Cordonnier-Pratt	93-37301-8779	\$ 140,000	07/15/93- 07/31/95
University of Hawaii, Manoa Honolulu, HI 96822 Title: Genetic Transformation of Grain Legumes for Improved Protein Quality	S. Sun	93-37301-8780	\$ 120,000	08/01/93- 07/31/95

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011 Title: Isolation and Characterization of the Maize Gene Sugary1, a Determinant of Starch Composition in Kernels	M. James A. Myers	93-37301-8671	\$ 60,000	07/01/93- 06/30/94
Iowa State University of Science and Technology Ames, IA 50011 Title: Selection for Second Site Mutations in the Wound-Induction Pathway	R. Thornburg	91-37301-6208	\$ 120,000	07/01/91- 06/30/95
University of Idaho Moscow, ID 83843 Title: Transposable Element-Mediated Dissection of Protein Structure and Function	C. Weil	93-37301-9358	\$ 113,000	09/15/93 09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Cis- and Trans-Acting Functions Mediating Ti Plasmid Transfer	S. Farrand	93-37301-8943	\$ 130,000	08/15/93- 08/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Gene Targeting of Plant Cells	T. Hodges L. Lyznik	91-37301-6375	\$ 120,000	09/01/91- 08/31/95

National Research Initiative Competitive Grants Program
 Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Purdue Research Foundation West Lafayette, IN 47907 Title: Cell Biology of T-DNA Transfer to Plant Cells	S. Gelvin	93-37301-9427	\$ 120,000	09/15/93- 09/30/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Arabidopsis Mitochondrial Genome Alterations in Response to Nuclear Genotype	S. MacKenzie	93-37301-9431	\$ 114,000	09/15/93- 09/30/95
Federation of American Societies for Experimental Biology Bethesda, MD 20814 Title: FASEB Summer Research Conference: Signal Transduction in Plants	C. Lamb C. Ryan	93-37301-8634	\$ 5,000	06/15/93 06/30/94
Michigan State University East Lansing, MI 48824 Title: Control of mRNA Stability in Dicotyledonous Plants	P. Green	93-37301-9359	\$ 210,000	09/15/93- 09/30/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Molecular Analysis of Maize Centromeres	J. Birchler	93-37301-8781	\$ 120,000	08/01/93- 07/31/95

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Duke University Durham, NC 27708 Title: Molecular Genetic Analysis of Systematic Acquired Resistance in <i>A. thaliana</i>	X. Dong	93-37301-8925	\$ 120,000	08/01/93-07/31/95
North Carolina State University Raleigh, NC 27695-7003 Title: DNA Replication in Plants: An Accessory Factor for Geminivirus Replication	L. Hanley-Bowdoin	93-37301-8786	\$ 70,000	07/01/93-06/30/94
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Gordon Research Conference on Plant Cell & Tissue Culture: Plant Transgenes-Tools for Discovery and Design	P. Maliga	93-37301-8787	\$ 5,000	06/01/93-05/31/94
Rutgers, The State University Piscataway, NJ 08855-1089 Title: A Transgenic Approach to Dissect Light Regulation of the Plastid psbD/C Operon	P. Maliga	93-37301-8822	\$ 140,000	09/01/93-08/31/95
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Isolation of Genes Coding for Plant Polyamine Biosynthetic Enzymes	G. Phillips G. Kuehn S. Bagga	93-37301-9429	\$ 110,000	09/15/93-09/30/95

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Environmentally Responsive DNA-bending by OccR	S. Winans	93-37301-8823	\$ 180,000	07/15/93- 07/31/96
Cornell University Ithaca, NY 14853 Title: A Structural and Transcriptional Analysis of the S-Locus Region of Brassica	J. Nasrallah	92-37301-7828++	\$ 75,000	09/01/92- 08/31/94
Cornell University Ithaca, NY 14853 Title: Regulation of Synthesis of Plant Mitochondrial Proteins	M. Hanson	93-37301-8841	\$ 60,000	09/01/93- 08/31/94
Cornell University Ithaca, NY 14853 Title: Function and Regulation of Chloroplast REC-A Protein	A. Jagendorf	91-37301-6421	\$ 120,000	09/01/91- 08/31/95
Ohio State University Research Foundation Columbus, OH 43210-1063 Title: Molecular Mechanisms of Geminivirus Replication	D. Bisaro	93-37301-9076	\$ 70,000	09/01/93- 08/31/94

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National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Oregon State University Corvallis, OR 97331 Title: A Multifunctional DNA Binding Protein Required for Gene Transfer to Plants	L. Ream	93-37301-8728	\$ 120,000	07/01/93-06/30/95
Oregon State University Corvallis, OR 97331 Title: Floral Homeotic Genes for Genetic Engineering of Sterility in Populus	S. Strauss W. Rottmann	93-37301-9425	\$ 120,000	09/15/93-09/30/95
Lehigh University Bethlehem, PA 18015 Title: Nuclear Gene Products and Chloroplast Gene Expression	M. Kuchka	93-37301-9428	\$ 95,000	09/15/93-09/30/95
Duquesne University Pittsburgh, PA 15282 Title: Regulatory Mutants of the Maize R Locus	M. Alleman	93-37301-8878	\$ 140,000	08/01/93-07/31/95
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: 1993 Gordon Research Conference on Plant Molecular Biology Signal Transduction and Membrane Proteins	W. Briggs	93-37301-8705	\$ 5,000	06/01/93-05/31/94

National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Clemson University Clemson, SC 29634-5326 Title: Characterization of the 12-Desaturase	G. Powell A. Abbott	93-37301-9426	\$ 112,000	09/15/93- 09/30/95
University of Texas Austin, TX 78713-7726 Title: Molecular Analysis of Cellulose Biosynthesis in <i>Acetobacter xylinum</i>	R. Brown I. Saxena	93-37301-9303	\$ 115,000	09/01/93- 08/31/95
Washington State University Pullman, WA 99164-5045 Title: Genetic Engineering of Non-Host Resistance in Plants	L. Hadwiger	93-37301-9503	\$ 115,000	09/15/93 09/30/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Molecular and Biochemical Analysis of the Maize Brittle-1 Gene	T. Sullivan	91-37301-6380	\$ 120,000	08/01/91- 07/31/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Molecular and Biochemical Analysis of Ubiquitin Conjugating Enzymes in Higher Plants	R. Vierstra	91-37301-6290++	\$ 79,000	07/01/91- 06/30/94

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National Research Initiative Competitive Grants Program
Plant Genetic Mechanisms and Molecular Biology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Tests for Ac/Ds-Induced Gene Conversion in Maize	J. Kermicle W. Eggleston	91-37301-6379	\$ 140,000	09/01/91- 08/31/95

Total : \$ 4,912,000

PLANT SYSTEMS

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PLANT GROWTH & DEVELOPMENT

This program area supports research aimed at increasing our basic understanding of mechanisms underlying the regulation of plant growth and development in order to achieve optimal productivity of agriculturally important crop plants and forest species. Research areas emphasized by the program include: (1) developmental regulation of gene expression, (2) mechanism of cell division, expansion and differentiation, (3) development and organization of meristems, (4) photomorphogenesis, (5) cell biology including cytoskeleton, membrane biology, organelle development and cell wall structure, (6) biochemistry of primary and secondary metabolism related to growth and development, (7) hormonal regulation of growth and development, and (8) analysis and control of growth patterns.

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Arizona Tucson, AZ 85721 Title: Targeting to the Inner Nuclear Membrane: Information from a Plant Viral Glycoprotein	D. Galbraith	93-37304-8882	\$ 110,000	08/15/93-08/31/95
University of Arizona Tucson, AZ 85721 Title: Transcription and RNA Stability During Plant Stress	H. Bohnert	93-37304-9367	\$ 110,000	09/15/93-09/30/95
The Regents of the University of California Berkeley, CA 94720 Title: Control of Proembryo Development in Higher Plants	R. Fischer	93-37304-9162	\$ 120,000	09/15/93-09/30/95
The Regents of the University of California Berkeley, CA 94720 Title: Transition to Flowering in Arabidopsis: Phase Change and Primordium Commitment	L. Feldman	93-37304-9141	\$ 97,500	09/15/93-09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: ACC Malonyltransferase: Isolation, Characterization and Molecular Cloning	S. Yang	93-37304-9366	\$ 115,000	09/15/93-09/30/95

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Interorgan Regulation of Ethylene Biosynthetic Genes Following Pollination	S. O'Neill	91-37304-6464	\$ 120,000	09/01/91- 08/31/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: An Analysis of Floral Regulatory Genes in Maize	R. Schmidt M. Yanofsky	93-37304-8910	\$ 120,000	08/01/93- 07/31/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0934 Title: Anion Channels in Higher Plants	J. Schroeder	92-37304-7757++	\$ 68,000	09/01/92 08/31/94
The Regents of the University of California Santa Barbara, CA 93106 Title: Mechanistic and Structural Studies of the ACC Oxidase Protein	R. Christoffersen M. Reich	93-37304-9161	\$ 130,000	09/15/93- 09/30/95
Yale University New Haven, CT 06511 Title: Molecular and Cellular Analysis of a Pro- and Cys-rich Protein Family in the Pistil	A. Cheung	93-37304-9438	\$ 120,000	09/15/93- 09/30/95

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National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Connecticut Storrs, CT 06269-2086 Title: Phosphoinositide-Specific Phospholipases C from Higher Plants	G. Cote R. Crain	93-37304-9576	\$ 120,000	09/15/93- 09/30/95
University of Connecticut Storrs, CT 06269-3125 Title: Genetic Analysis of Plant Cell Wall Structure and Function	W. Reiter	93-37304-9510	\$ 115,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Brain Proteins in Plants: The Arabidopsis GF14 Gene Family	R. Ferl	93-37304-9608	\$ 115,000	09/15/93 09/30/95
University of Florida Gainesville, FL 32611 Title: Tomato Fruit Locule Tissue Liquefaction and Ripening	D. Huber J. Brecht	93-37304-9575	\$ 130,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: The Role of Calcium-Dependent Protein Kinase in Plant Signal Transduction	A. Harmon	91-37304-6654++	\$ 68,000	09/15/91- 09/30/94

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National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Cytoskeleton and Development of Generative Cells	B. Palevitz	93-37304-9142	\$ 120,000	08/15/93- 08/31/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Phytochrome and Potential Photomorphogenic Loci in the Grasses	M. Cordonnier-Pratt L. Pratt	93-37304-9362	\$ 120,000	09/15/93- 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Extensin Structural Motifs and Functional Domains	M. Kieliszewski	93-37304-9364	\$ 120,000	09/15/93 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Development, Genomic Diversity, and Gene Expression in Aposporous Genotypes	P. Ozias-Akins W. Hanna	93-37304-9363	\$ 120,000	09/15/93- 09/30/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Phytochrome mRNA Degradation: Cis-elements, Factors, and Pathway	J. Colbert	93-37304-8944	\$ 120,000	08/15/93- 08/31/95

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Iowa Iowa City, IA 52242 Title: Sex Determination and Floral Development in Maize	E. Irish	93-37304-9437	\$ 110,000	09/15/93- 09/30/95
Board of Trustees at the University of Illinois Chicago, IL 60612-7227 Title: Isolation of the Blue Light Receptor and the Blue Light Activated G-Protein	L. Kaufman	92-37304-7914++	\$ 68,000	09/01/92- 08/31/94
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Molecular Characterization of CaBP-22, a Leaf-Specific, EF-Hand Ca ²⁺ -Binding Protein	R. Zielinski	93-37304-8986	\$ 140,000	09/01/93 08/31/95
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803 Title: 1st International Symposium of Plant Dormancy	G. Lang T. Chen R. Darnel A. Khan	93-37304-9372**	\$ 3,500	09/15/93- 09/30/94
Board of Supervisors Louisiana State University & A&M College Baton Rouge, LA 70803-3805 Title: Phosphatidylethanolamine Biosynthesis and Utilization in Plants	T. Moore	93-37304-9368	\$ 112,000	09/15/93- 09/30/95

** Split Funded Award ++ Continuation Award

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Massachusetts Amherst, MA 01003 Title: Cell Division in Plants: The Role of Calcium, Membranes, and the Cytoskeleton	P. Hepler	91-37304-6832++	\$ 77,000	09/01/91- 08/31/94
Massachusetts Institute of Technology Cambridge, MA 02139 Title: Repeat-Induced Gene Silencing in Arabidopsis	E. Signer	93-37304-8945	\$ 70,000	08/15/93- 08/31/94
University of Maryland, Baltimore County Baltimore, MD 21228 Title: Hormonal Control of Gene Expression During Seed Maturation	M. Bustos	93-37304-9439	\$ 100,000	09/15/93 09/30/95
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Differential Gene Expression for Anthocyanin in Juvenile and Mature Ivy	W. Hackett A. Smith	93-37304-9369	\$ 100,000	09/15/93- 09/30/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Temporal and Spatial Control of Phytohormone Overproduction in Transgenic Plants	Y. Li	93-37304-9436	\$ 100,000	09/15/93- 09/30/95

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National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Washington University St. Louis, MO 63130 Title: Drought Stress Induced Gene Expression in Plants	T. Ho	91-37100-6625	\$ 5,757	08/15/91- 08/31/94
Duke University Durham, NC 27708 Title: Suppressor Analysis of Mutant Cytochrome f Thylakoid Insertion	B. Kohorn	93-37304-9370	\$ 140,000	09/15/93- 09/30/95
North Carolina State University Raleigh, NC 27695-7003 Title: The Glossy-15 Gene of Maize, a Cell-specific Regulator of Leaf Epidermal Traits	R. Dewey P. Sisco D. Danehower	93-37304-8916	\$ 164,000	08/01/93- 07/31/96
North Carolina State University Raleigh, NC 27695-7003 Title: Role of Novel Mannitol Dehydrogenase in Sink Metabolism and Salt Tolerance	D. Pharr M. Conkling	93-37304-8931	\$ 120,000	08/01/93- 07/31/95
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: UPD-Glucose Pyrophosphorylase Regulation of Potato Carbohydrate Metabolism	P. McClean	93-37304-9284	\$ 100,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Purification and Characterization of Xyloglucan Xylosyl Transferase	A. White	93-37304-9441	\$ 100,000	09/15/93- 09/30/95
University of Nebraska Lincoln, NE 68588-0430 Title: Use of Arabidopsis Trichome Mutants to Isolate Genes Involved in Cell Expansion	M. Marks	91-37304-6470	\$ 115,000	09/01/91- 08/31/95
Rutgers, The State University Piscataway, NJ 08855-1089 Title: Mechanism of Systemic Accumulation of Salicylic Acid During the Development of Induced Disease Resistance in Plants	I. Raskin	93-37304-9283	\$ 70,000	09/01/93 08/31/94
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Lysophosphatidic Acid Acyltransferase: Enzyme and Gene Isolation from Soybean	R. Rajasekharan J. Kemp	93-37304-9434	\$ 100,000	09/15/93- 09/30/95
Research Foundation of State University of New York Albany, NY 12201 Title: Pollen Development and Relevance of Heat Shock Proteins	J. Mascarenhas	92-37304-7869	\$ 15,000	09/01/92- 08/31/94

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Rensselaer Polytechnic Institute Troy, NY 12180-3590 Title: Patterns of Developmental Events in Floral Initiation	C. McDaniel	93-37304-9440	\$ 80,000	09/15/93- 09/30/95
Case Western Reserve University Cleveland, OH 44106 Title: Regulation and Mechanism of the Self-Incompatibility Response of Flowering Plants	V. Dzelzkalns	93-37304-9365	\$ 112,000	09/15/93- 09/30/95
Ohio State University Research Foundation Columbus, OH 43210 Title: Fifth International Conference on Arabidopsis Research	R. Hangarter	93-37304-8987	\$ 5,000	08/15/93 08/31/94
Miami University Oxford, OH 45056 Title: Regulation of Microsporogenesis in Arabidopsis thaliana	C. Makaroff	91-37304-6749	\$ 115,000	09/15/91- 09/30/95
University of Oklahoma Norman, OK 73019 Title: Cytoskeleton Involvement During Fertilization in Flowering Plants	S. Russell	91-37304-6471	\$ 125,000	09/01/91- 08/31/95

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Oregon State University Corvallis, OR 97331 Title: Workshop on Stems and Trunks in Plant Form and Function	B. Gartner	93-37100-9063**	\$ 5,000	09/01/93-06/30/94
University of Oregon Eugene, OR 97403 Title: Molecular and Genetic Analysis of Arabidopsis Inflorescence Development	D. Meeks-Wagner	93-37304-9040	\$ 210,000	08/15/93-08/31/96
USDA/ARS North Atlantic Area Philadelphia, PA 19118 Title: Potassium Transport in Higher Plants: A Molecular, Biophysical and Developmental Analysis	L. Kochian W. Lucas	93-37304-9081	\$ 210,000	09/01/93-08/31/96
Trustees of the University of Pennsylvania Philadelphia, PA 19104 Title: Plant MDR Homologues: A Molecular and Biochemical Study	P. Rea	93-37304-8932	\$ 115,000	08/15/93-08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Functional Characterization of a Pollen-Specific Receptor Kinase of Petunia	T. Kao S. Gilroy	93-37304-8883	\$ 210,000	08/01/93-07/31/96

** Split Funded Award

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Cellular and Molecular Biology of the Plant and Fungal Cytoskeleton	D. Fosket	93-37304-9005	\$ 5,000	07/15/93- 07/31/94
University of Texas Austin, TX 78713-7726 Title: The Biochemistry of Glycosyl-phosphatidylinostol-anchored Proteins in Plants	G. Thompson	93-37304-9228	\$ 85,000	09/01/93- 08/31/95
University of Utah Salt Lake City, UT 84112 Title: Molecular Analysis of Floral Meristem Organization	G. Drews	93-37304-9371	\$ 120,000	09/15/93 09/30/95
Washington State University Pullman, WA 99164-5045 Title: Regulation of Flavonol Aglycone Metabolism in Petunia and Maize Pollen	L. Taylor	93-37304-9435	\$ 115,000	09/15/93- 09/30/95
University of Washington Seattle, WA 98195 Title: Gibberellin Action Genes	R. Wilson	93-37304-9509	\$ 80,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Plant Growth & Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706	M. Sussman	92-37304-8058	\$ 5,000	09/15/92- 09/30/95
Title: Characterization of Protein Isoforms Encoded by the Calcium Dependent Protein Kinase Gene Family of Arabidopsis thaliana				

Total : \$ 5,665,757

PLANT SYSTEMS

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PHOTOSYNTHESIS AND RESPIRATION

Towards expanding our knowledge of fundamental aspects of energy capture and utilization by plants, research funded by this program extends from studies on solar energy absorption to analyses of crop productivity. Research supported includes studies on primary events of light absorption, energy transduction and utilization; structure, synthesis, turnover and interactions of components of the photosynthetic and respiratory systems; mechanisms of carbon dioxide absorption and fixation; metabolism and biochemistry of energy-rich compounds; and translocation and partitioning of photosynthates in the whole plant.

National Research Initiative Competitive Grants Program
Photosynthesis and Respiration

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Arizona State University Tempe, AZ 85287-1903 Title: Specific Mutagenesis of the Photosystem I Reaction Center in Chloroplasts	A. Webber S. Bingham	91-37306-6473	\$ 110,000	08/15/91- 08/31/95
University of Arizona Tucson, AZ 85721 Title: Genetic Dissection of Carotenogenesis in Higher Plants: Phytoene Desaturation	D. Penna	93-37306-9083	\$ 100,000	09/15/93- 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: The Reaction Center of PSII: Isolation, Characterization and Crystallography	M. Okamura N. Adir	93-37306-9579	\$ 110,000	09/15/93 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Structure Studies of a Cyt c2-Reaction Center Complex from Rb. sphaeroids	H. Axelrod	93-37306-9182	\$ 100,000	09/15/93- 09/30/95
The Regents of the University of California Los Angeles, CA 90024-1406 Title: Steps in the In vivo Synthesis of Plastocyanin	S. Merchant	91-37306-6348++	\$ 55,000	08/01/91- 07/31/94

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National Research Initiative Competitive Grants Program
Photosynthesis and Respiration

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Los Angeles, CA 90024-1406 Title: The Light-harvesting Complexes of Photosystems I and II	J. Thornber	93-37306-9577	\$ 110,000	09/15/93- 09/30/95
University of Delaware Newark, DE 19716 Title: Rate Limitations for Photosynthesis in Intact Leaves	J. Boyer	93-37306-9578	\$ 110,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Regulation of the Primary Carboxylases in Aquatic Plants	G. Bowes	93-37306-9386	\$ 65,000	09/15/93 09/30/94
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Molecular Biochemistry of Herbicide Resistance	C. Wraight	92-37306-7692++	\$ 50,000	09/01/92- 08/31/94
Purdue Research Foundation West Lafayette, IN 47907 Title: Regulation of Photosynthesis, N ₂ -Fixation and Granule Formation in Cyanobacteria	L. Sherman	93-37306-9238	\$ 103,000	09/15/93- 09/30/95

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National Research Initiative Competitive Grants Program
Photosynthesis and Respiration

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Purdue Research Foundation West Lafayette, IN 47907 Title: Determination of the Crystal Structures of Cytochrome f and the Rieske Protein	J. Smith W. Cramer	91-37306-6317	\$ 103,000	09/01/91-08/31/95
University of Kansas Lawrence, KS 66045 Title: Mode of Selective Inhibition of Photosynthetic Phosphorylation by Tentoxin	M. Richter P. Gegenheimer	93-37306-9633	\$ 85,000	09/15/93-09/30/95
Kansas State University Manhattan, KS 66506 Title: Topology and Assembly of the Photosystem 1 Reaction Center Core	J. Guikema	93-37306-9147	\$ 110,000	09/15/93-09/30/95
Board of Supervisors Louisiana State University & A&M College Baton Rouge, LA 70803-3805 Title: Domains on CPa-1 Which Interact with Component Required for Oxygen Evolution	T. Bricker	91-37306-6350	\$ 110,000	09/01/91-08/31/95
Massachusetts General Hospital Boston, MA 02114 Title: Molecular Mechanisms of Maize C4PPDK Gene Regulation	J. Sheen	91-37306-6352++	\$ 55,000	09/01/91-08/31/94

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National Research Initiative Competitive Grants Program
Photosynthesis and Respiration

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: Charge Separation and Stabilization in Chloroplast Photosystem II	G. Babcock	92-37306-7694++	\$ 50,000	09/01/92-08/31/94
Michigan State University East Lansing, MI 48824 Title: Interaction of Starch Synthase and Branching Enzyme Isoforms in Starch Synthesis	J. Preiss	93-37306-9148	\$ 100,000	09/01/93-08/31/95
Board of Regents University of Nevada System Reno, NV 89557 Title: Branched-Chain Monosaccharides in Leaves: Biochemistry and Environmental Responses	J. Seemann B. Moore	93-37306-9240	\$ 110,000	09/01/93-08/31/95
Research Foundation of the State University of New York Buffalo, NY 14260 Title: Molecular Biology of C4 Photosynthesis in Grain Amaranth	J. Berry	93-37306-9041	\$ 65,000	09/01/93-08/31/94
Cornell University Ithaca, NY 14853 Title: Molecular Mechanism of Nonphotochemical Quenching of Chlorophyll Excited States	T. Owens	93-37306-9042	\$ 100,000	09/01/93-08/31/95

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National Research Initiative Competitive Grants Program
Photosynthesis and Respiration

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
New York University New York, NY 10003 Title: Characterization of Two Fd-GOGAT Genes and Their Roles in Photorespiration	K. Coschigano	93-37306-9285	\$ 70,000	09/15/93- 09/30/95
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Photosynthetic CO2 Fixation and Metabolism in Green Plants	S. Huber	93-37306-9006	\$ 12,000	09/01/93- 08/31/94
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Gordon Conference on Photosynthesis: Biochemical Aspects	B. Diner	93-37306-8969	\$ 12,000	08/01/93 07/31/94
Brown University Providence, RI 02912 Title: Biosynthesis of Phycobilins	S. Beale	93-37306-9043	\$ 150,000	09/01/93- 08/31/96
Vanderbilt University Nashville, TN 37240 Title: Dynamics of Excitation Energy Storage in Allophycocyanin and C-Phycocyanin	W. Beck	93-37306-9044	\$ 110,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Photosynthesis and Respiration

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas Tech University Lubbock, TX 79409-1035 Title: Electron Flow in Photosynthetic Bacteria	D. Knaff	93-37306-9084	\$ 150,000	09/01/93-08/31/96
Utah Agric. Experiment Station Utah State University Logan, UT 84322 Title: Limitation of Nonsteady-state Photosynthesis by Rubisco	K. Mott	91-37306-6326	\$ 110,000	09/01/91-08/31/95
The Medical College of Wisconsin, Inc. Milwaukee, WI 53226 Title: Regulated Enzymes in CO2 Fixation: Mechanisms of Activation and Catalysis	H. Miziorko	93-37306-9181	\$ 165,000	09/01/93-08/31/96

Total : \$ 2,580,000

PLANT SYSTEMS

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NITROGEN FIXATION/METABOLISM

Grants in this program support research which will improve our understanding of how nitrogen is fixed biologically, metabolized and cycled by crop plants. These goals are of importance to sustainable plant production, since availability of nitrogen is a common limiting factor in plant growth, and because of costs associated with application of nitrogen fertilizers. Areas supported by the program include, but are not limited to: chemistry of biological nitrogen fixation; factors limiting biological nitrogen fixation; plant-microbe interactions involved in establishing and maintaining the biological-nitrogen fixation symbioses; ecology of free-living and symbiotic nitrogen-fixing microorganisms, and metabolism of nitrogenous compounds by higher plants.

National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: The Bioenergetics of Ammonium and Nitrate Acquisitions	A. Bloom	93-37305-9143	\$ 110,000	09/01/93- 08/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Defining Functional Roles of Alfalfa Seed nod-Gene Inducers	D. Phillips	91-37305-6513	\$ 90,000	09/01/91- 08/31/95
The Regents of the University of California Los Angeles, CA 90024-1406 Title: Are Lectins Involved in Legume Nodulation?	A. Hirsch	93-37305-9144	\$ 90,000	09/01/93 08/31/95
University of Delaware Newark, DE 19716 Title: Rhizobitoxine Effects on the Soybean Symbiosis Under Field Conditions	J. Fuhrmann B. Vasilas	93-37305-9511	\$ 55,000	09/15/93- 09/30/94
Florida International University Miami, FL 33199 Title: Symbiosis and Control Over Heterocyst Differentiation in N ₂ -Fixing Cyanobacteria	J. Elhai	93-37305-9308	\$ 90,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Structural Characterization of Bradyrhizobium japonicum Nodulation Signals	R. Carlson	93-37305-9603	\$ 110,000	09/15/93- 09/30/95
Northwestern University Evanston, IL 60201 Title: Single-Crystal and Solution Endor Studies of Nitrogenase	B. Hoffman	93-37305-9623	\$ 50,000	09/15/93- 09/30/94
Purdue Research Foundation West Lafayette, IN 47907 Title: Crystallographic Studies of Nitrogenase	J. Bolin	91-37305-6661	\$ 40,000	09/15/91 09/30/94
Johns Hopkins University Baltimore, MD 21218 Title: Analysis of Components Responsible for Protection of Nitrogenase from Oxygen Inactivation	R. Maier F. Moshiri	91-37305-6583	\$ 90,000	08/15/91- 08/31/95
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Role of B-1,3;B-1,6-Glucans in Plant-Microbe Interactions	D. Keister A. Bhagwat	93-37305-9233	\$ 80,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: Mechanistic and Structural Characterization of a Bacterial Urease	R. Hausinger P. Karplus	91-37305-6515	\$ 180,000	09/01/91- 08/31/95
Individual Awardee Falcon Heights, MN 55108 Title: Molecular Analysis of Senescence in Lotus Japonicus Root Nodules	R. Gregerson	93-37305-9443	\$ 80,000	09/15/93- 09/30/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Analysis of a Cluster of Citric Acid Cycle Genes from Bradyrhizobium japonicum	D. Emerich	93-37305-9146	\$ 110,000	09/01/93 08/31/95
The Curators of the University of Missouri St. Louis, MO 63121 Title: Molecular Genetics of a Second nif Gene Cluster in Anabaena variabilis	T. Thiel	93-37305-9309	\$ 90,000	09/15/93- 09/30/95
Washington University St. Louis, MO 63130 Title: Nitrogen Fixation in Photosynthetic Bacteria: New Gene Regulatory Mechanisms	R. Kranz	93-37305-9145	\$ 106,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7514	T. Monaco J. Huber S. Huber	93-37305-9231	\$ 120,000	09/15/93- 09/30/95
Title: Regulation of Leaf Nitrate Reductase by Protein Phosphorylation in Spinach and Maize				
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704	R. Klucas	91-37305-6705	\$ 110,000	09/01/91- 08/31/95
Title: Maintaining Functional Leghemoglobin in Legume Nodules				
Research Foundation of the State University of New York Buffalo, NY 14260	M. O'Brian	91-37305-6750	\$ 106,000	09/01/91 08/31/94
Title: 5-aminolevulinic Acid (ALA) Formation in Legume Root Nodules				
Drexel University Philadelphia, PA 19104	R. Dickstein	91-37305-6584	\$ 90,000	09/01/91- 08/31/95
Title: ENOD8: An Early Nodule Specific Gene Associated with Nodule Organogenesis				
University of South Carolina Columbia, SC 29208	L. Marton	93-37305-9442	\$ 90,000	09/15/93- 09/30/95
Title: Homologous Recombination Approach for the Molecular Biology of Arabidopsis NR Genes				

National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Tennessee Knoxville, TN 37996-0140 Title: Structure, Function and Regulation of Soybean Nodulin 26	D. Roberts	91-37305-6752++	\$ 50,000	09/01/91-08/31/94
University of Tennessee Knoxville, TN 37996-0140 Title: Host Plant Gene Expression During the Development of Actinorhizal Root Nodules	B. Mullin	93-37305-9082	\$ 100,000	09/15/93-09/30/95
Texas A&M Research Foundation College Station, TX 77843 Title: Regulation of Cyanobacterial Heterocyst and Nitrogen-Fixation Genes	J. Golden	91-37305-6706++	\$ 50,000	09/01/91-08/31/94
Texas A&M Research Foundation College Station, TX 77843 Title: Plant Cell Wall Biogenesis and Specialization During Symbiosis	K. VandenBosch	92-37305-7815++	\$ 55,000	09/01/92-08/31/94
Texas A&M Research Foundation College Station, TX 77843 Title: A Peroxidase Gene Induced During Nodule Initiation in <i>Medicago truncatula</i>	D. Cook K. VandenBosch	93-37305-9230	\$ 110,000	09/15/93-09/30/95

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National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Brigham Young University Provo, UT 84602 Title: The Mechanism of Nitrogenase Catalysis	G. Watt	93-37305-9234	\$ 120,000	09/01/93-08/31/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Nitrogen-Fixation (nif) Genes and Their Products in Clostridium	J. Chen J. Johnson	93-37305-9235	\$ 90,000	09/15/93-09/30/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: P Clusters and Nitrogenase Catalysis	W. Newton	91-37305-6662	\$ 120,000	09/15/91-09/30/95
Washington State University Pullman, WA 99164-5045 Title: Rhizobium Amino Acid Metabolism and Symbiotic Nitrogen Fixation	M. Kahn	92-37305-7723++	\$ 55,000	09/01/92-08/31/94
Washington State University Pullman, WA 99164-5045 Title: Lipoxygenase, Molecular Signals, and Nitrogen Partitioning in Soybeans	H. Grimes	93-37305-9229	\$ 108,000	09/15/93-09/30/95

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National Research Initiative Competitive Grants Program
Nitrogen Fixation/Metabolism

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: A Biochemical Investigation of the Alternative Nitrogenase System from R. rubrum	P. Ludden	93-37305-9232	\$ 40,000	09/01/93- 08/31/94
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Analysis of the ADP-ribosylation of R. Rubrum	G. Roberts	93-37305-9237	\$ 130,000	09/01/93- 08/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Genetic Analysis of Nodulation Competitiveness of Rhizobium leguminosarum bv. phaseoli	J. Handelsman	93-37305-9236	\$ 90,000	09/15/93 09/30/95

Total : \$ 3,005,000

PLANT SYSTEMS

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PLANT PATHOLOGY/WEED SCIENCE

Research grants in this program support studies on stress on plants arising from their interactions with other plants, and with microbial agents including fungi, bacteria, viruses, and mycoplasma-like organisms. The ultimate goal is to limit losses in plant productivity from damage caused by biologically-generated stresses.

Emphasis in this area is on studies that will enhance understanding of how stressful interactions are established between plants and other biological agents; how such interactions are influenced by environment and other factors inherent to the interacting organisms; how the interactions reduce plant productivity and usefulness to people; how plants react to stress generated by such interactions; and how the damage of such interactions may be limited or eliminated.

National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas Fayetteville, AR 72701	J. Correll D. Rhoads G. Weidemann T. Morelock	92-37303-8006++	\$ 50,000	09/15/92- 09/30/94
Title: Genetic and Molecular Population Diversity in Colletotrichum				
University of Arizona Tucson, AZ 85721	L. Pierson	92-37303-7610++	\$ 50,000	08/01/92- 07/31/94
Title: Expression of Microbial Biological Control Genes in the Rhizosphere				
University of Arizona Tucson, AZ 85721	H. VanEtten	91-37303-5942	\$ 10,000	07/01/91 12/31/93
Title: Pathogenicity Genes on Dispensable Chromosomes as a Mechanism of Natural Variation in Pathogenic Fungi				
USDA, ARS, Pacific West Area Albany, CA 94710	L. Thomashow D. Weller R. Cook	91-37303-6769	\$ 100,000	09/01/91- 08/31/95
Title: Phenazine Gene Structure, Regulation and Manipulation for Improved Biocontrol				
The Regents of the University of California Berkeley, CA 94720	L. Epstein	93-37303-8881	\$ 100,000	09/01/93- 08/31/95
Title: Adhesion of Nectria haematococca Macroconidia to Plant Surfaces				

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Berkeley, CA 94720 Title: The Origins of Virulence Diversity in <i>Fusarium oxysporum</i> f. sp. melonis	T. Gordon	91-37303-6385	\$ 100,000	09/01/91- 08/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Characterizing Avirulence Genes from <i>Phytophthora Infestans</i>	H. Judelson	93-37303-8908	\$ 140,000	08/01/93- 07/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Polygalacturonase Inhibitor Proteins: Their Role in Plant Defense Against Pathogens	J. Labavitch A. Bennett	93-37303-9004	\$ 100,000	09/01/93 08/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Lipxygenase and Lipoxygenase-Mediated Products in Plant Defense	R. Bostock	91-37303-6504	\$ 90,000	08/15/91- 08/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Replication of a Plant Virus Satellite RNA	G. Bruening	93-37303-9508	\$ 20,800	09/15/93- 09/30/94

National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Riverside, CA 92521 Title: Copper Resistance in Survival of Biological Control Agents in Soil	D. Cooksey	93-37303-9227	\$ 100,000	09/15/93- 09/30/95
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Quantitative Determination of Inoculum Dispersal Potential	D. Aylor	93-37303-9134	\$ 90,000	09/15/93- 08/31/95
University of Florida Gainesville, FL 32611 Title: B-chromosomes in Plant Pathogenic Fungi	H. Kistler	93-37303-9031	\$ 129,930	09/01/93 08/31/96
University of Florida Gainesville, FL 32611 Title: Host Range Determinants of Tobamoviruses	W. Dawson	92-37303-7752	\$ 119,662	09/01/92- 08/31/95
University of South Florida Tampa, FL 33620 Title: Protein Phosphorylation in the Cell Signaling of the Hypersensitive Response of TMV Infected Tobacco	D. Dunigan	93-37303-9135	\$ 60,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Modeling Peanut and Weed Competition for Light and Water	D. Bridges D. NeSmith	91-37303-6696	\$ 100,000	09/15/91- 09/30/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Translational Frameshifting by Barley Yellow Dwarf Virus	W. Miller	91-37303-6424	\$ 120,000	09/15/91- 09/30/95
University of Idaho Moscow, ID 83843 Title: Biochemistry and Genetics of Sulfonylurea-Insensitive Acetolactate Synthase	C. Eberlein D. Thill D. Hoffman J. Fellman	91-37303-6697++	\$ 50,000	09/15/91- 09/30/94
University of Idaho Moscow, ID 83843 Title: Physiology and Genetics of Sulfonylurea Herbicide Resistant Kochia	C. Eberlein E. Souza	93-37303-9574	\$ 100,000	09/15/93- 09/30/95
Northern Illinois University DeKalb, IL 60115-2874 Title: Pathogenesis and Strain Diversity of the Geminivirus Beet Curly Top Virus	D. Stenger	93-37303-9384	\$ 130,000	09/15/93- 09/30/95

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Indiana University Bloomington, IN 47402 Title: Molecular Cloning of Disease Resistance Genes from Arabidopsis and Soybean	R. Innes	93-37303-9136	\$ 80,000	09/15/93-09/30/95
Kansas State University Manhattan, KS 66506 Title: Analysis of the Rp1 and Rp3 Loci of Maize	S. Hulbert	91-37303-5883	\$ 140,000	08/01/91-07/31/95
Kansas State University Manhattan, KS 66506 Title: Interactions Between Virus Particles and Plants During Pathogenesis	L. Heaton	91-37303-6698	\$ 90,000	09/01/91-08/31/95
Kansas State University Manhattan, KS 66506 Title: Inheritance of Mycorrhizal Dependence in Wheat: Impact on Yield Sustainability	B. Hetrick T. Cox B. Gill	93-37303-9169	\$ 100,000	09/15/93-09/30/95
Kansas State University Manhattan, KS 66506 Title: Mechanisms in the Biocontrol of Annual Grass Weeds and Fungi by Rhizobacteria	M. Mazzola	93-37303-9137	\$ 77,000	09/15/93-09/30/95

National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Kentucky Research Foundation Lexington, KY 40506-0057	C. Schardl M. Siegel L. Bush	92-37303-7612++	\$ 58,000	08/01/92- 07/31/94
Title: Natural and Modified Grass Endophytes as Agents for Biological Protection				
University of Kentucky Research Foundation Lexington, KY 40506-0057	T. Pirone P. Atreya E. Ammar	93-37303-9138	\$ 130,000	09/01/93- 08/31/95
Title: Role of Coat Protein and Helper Component in Aphid Transmission of Potyviruses				
University of Kentucky Research Foundation Lexington, KY 40506-0057	S. He	93-37303-9385	\$ 70,000	09/15/93 09/30/94
Title: Genetic and Biochemical Analysis of the Hypersensitive Response in Higher Plants				
University of Kentucky Research Foundation Lexington, KY 40506-0057	M. Barrett	93-37303-9032	\$ 158,840	09/15/93- 09/30/95
Title: Genetic Control of a Putative Multiple Pesticide Metabolizing Cytochrome P-450				
USDA/ARS Beltsville Area Beltsville, MD 20705	R. Owens R. Hammond	91-37303-6649++	\$ 60,000	09/15/91- 09/30/94
Title: Genetic and Structural Determinants of Viroid-Host Interaction				

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maine Orono, ME 04469-5715 Title: Legume Green Manure Effects on Bean/Wild Mustard Interference	M. Liebman	93-37303-8909	\$ 120,000	08/01/93- 07/31/96
Michigan State University East Lansing, MI 48824 Title: Role of Cell Wall-Degrading Enzymes in Plant Pathogenesis	J. Walton	91-37303-6312	\$ 120,000	07/15/91- 07/31/95
Individual Awardee East Lansing, MI 48823 Title: Characterization of RXC1 Expression in Arabidopsis	C. Buell	93-37303-9361	\$ 77,000	09/15/93 09/30/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Harpin-Induced Pertubation of Plant Cell Membranes	A. Novacky	93-37303-9139	\$ 120,000	09/01/93- 08/31/95
Montana State University Bozeman, MT 59717 Title: Assessing Weed Management Strategies that Prevent Evolution of Weed Resistance to Herbicides	B. Maxwell W. Dyer P. Fay	93-37303-9433	\$ 57,339	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7003 Title: Molecular Analysis of the Plant Virus Cell-to-Cell Movement Mechanism	S. Lommel D. Giesman-Cookmeyer	93-37303-8929	\$ 100,000	08/15/93- 08/31/95
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Pathogenic Variation in the Crown Rust Pathogen, Puccinia coronata	B. Steffenson Y. Jin A. Roelfs	93-37303-9170	\$ 100,000	09/01/93- 08/31/95
University of Nebraska Lincoln, NE 68588-0430 Title: Molecular Structure and Function of Carmovirus Genomes	T. Morris	93-37303-9033	\$ 120,000	09/01/93 08/31/95
Rutgers, The State University Piscataway, NJ 08855-1089 Title: Structure and Function of Viral dsRNAs of the Chestnut Blight Fungus	B. Hillman	91-37303-6651++	\$ 50,000	09/01/91- 08/31/94
Research Foundation of State University of New York Amherst, NY 14228 Title: Cloning and Expression of Ustilago maydis Virus Toxin Genes	J. Bruenn	92-37303-8310++	\$ 90,000	09/15/92- 09/30/94

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Plant-inducible Pectate Lyase Isozymes and Virulence of <i>Erwinia chrysanthemi</i>	A. Collmer	91-37303-6321++	\$ 60,000	07/01/91- 06/30/94
Cornell University Ithaca, NY 14853 Title: Characteristics of Harpin Essential to its Activity in Plants	S. Beer	91-37303-6430	\$ 130,000	08/01/91- 07/31/95
Agricultural Expt. Station Cornell University Ithaca, NY 14853 Title: Thigmotropically-Controlled Appressorium Proteins of <i>Uromyces</i>	H. Hoch R. Staples	93-37303-8991	\$ 60,000	09/01/93 08/31/94
Cornell University Ithaca, NY 14853 Title: Tox-Mutants and Polyketide Synthase Genes for Molecular Investigation of Polyketide Toxin Production	O. Yoder B. Turgeon	93-37303-8984	\$ 180,000	09/01/93- 08/31/96
Cornell University Ithaca, NY 14853 Title: Phytotoxins as Pathogenicity Factors in <i>Streptomyces</i> Species	R. Loria	93-37303-8983	\$ 100,000	09/01/93- 08/31/95

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853	W. Fry S. Goodwin D. Legard	93-37303-8982	\$ 50,000	09/01/93- 08/31/94
Title: Genetics of <i>Phytophthora infestans</i> : Host (Genus) Pathogenicity				
Cornell University Ithaca, NY 14853	M. Milgroom	93-37303-9035	\$ 60,000	09/01/93- 08/31/94
Title: Transmission of Hypovirulence in Populations of <i>Cryphonectria parasitica</i>				
Cornell University Ithaca, NY 14853	G. Harman	93-37303-9034	\$ 99,956	09/01/93 08/31/95
Title: Molecular Assessment of the Role of Chitinolytic Enzymes in Biocontrol				
Cornell University Ithaca, NY 14853	B. Turgeon O. Yoder	92-37303-7800++	\$ 70,000	09/01/92- 08/31/94
Title: Interspecific Mating by Transfer of Mating Type Genes Between <i>Cochliobolus</i> spp.				
Oklahoma State University Stillwater, OK 74078	M. Essenberg M. Pierce	91-37303-6652	\$ 100,000	08/01/91- 07/31/95
Title: Cellular Expression of Phytoalexin Biosynthesis in Cotton Foliar Tissue				

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Oklahoma State University Stillwater, OK 74078 Title: Functions of MCMV Genes in Single and Synergistic Infections of Corn	K. Scheets	93-37303-9036	\$ 60,000	09/01/93-08/31/95
Oregon State University Corvallis, OR 97331 Title: A Plus Sense RNA-Based Virus Resistance Strategy	W. Dougherty	92-37303-7893++	\$ 70,000	09/01/92-08/31/94
Oregon State University Corvallis, OR 97331 Title: Stripe Rust as an Influence on the Temporal Dynamics of Wheat Mixtures	C. Mundt	91-37303-6700	\$ 50,000	09/15/91-09/30/94
Oregon State University Corvallis, OR 97331 Title: Assessment of Environmental Compatibility Between an Antagonist and a Target Pathogen in Biological Control	J. Loper	93-37303-9037	\$ 100,000	09/01/93-08/31/95
Oregon State University Corvallis, OR 97331 Title: Molecular Analysis of Pathogenicity in the Fungus that Causes Tan Spot of Wheat	L. Ciuffetti	93-37303-9038	\$ 100,000	09/01/93-08/31/95

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National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802 Title: Multiple Modes of Resistance of Fungal Plant Pathogens to Fungicides	M. Tien E. Pell A. Orth	93-37303-9140	\$ 100,000	09/01/93- 08/31/95
Clemson University Clemson, SC 29634-5326 Title: Genetic Regulation of Appressorium Formation in Magnaporthe grisea	R. Dean	91-37303-6653	\$ 70,000	09/01/91- 08/31/95
Agricultural Expt. Station University of Tennessee Knoxville, TN 37901-1071 Title: Impact of Antibiotic-Producing Pseudomonads on Nontarget Soil Bacteria	B. Ownley	93-37303-8985	\$ 95,473	09/01/93 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Proteolytic Processing and Function of Potyviral Proteins	J. Carrington	91-37303-6435	\$ 160,000	08/01/91- 07/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: RFLP Markers to Measure Gene Flow in Pathogenic Fungi	B. McDonald	93-37303-9039	\$ 90,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Plant Pathology/Weed Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Characterization of Glutathione S-Transferase Activity in Rice (Oryza sativa)	K. Hatzios	93-37303-8930	\$ 100,000	09/15/93-09/30/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Bacterial Community Dynamics in the Phyllosphere	S. Hirano C. Upper	91-37303-6573++	\$ 60,000	09/01/91-08/31/94
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Peptide Synthetase Genes from Acremonium coenophialum	D. Panaccione	93-37303-9160	\$ 100,000	09/01/93-08/31/95

Total : \$ 5,744,000

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PLANT SYSTEMS

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ENTOMOLOGY/NEMATOLOGY

Research grants in this area support studies on plant stress arising from interactions with insects, nematodes, or mites. The goal of the program is to support research which will lead to ways of reducing losses in plant productivity from damage caused by these organisms, and to do so in such a way as to sustain agricultural systems.

Research on plant/insect or plant/nematode interactions is encouraged as is research into the basic biology of these particular invertebrates. Specific emphasis is placed on but not limited to the following areas: (1) mechanisms of plant defense and resistance against insect attack (biochemical or genetic), (2) insect or nematode growth, development and reproduction (physiological, biochemical or molecular studies), (3) physiological and ecological interactions of biological control agents with their hosts (includes beneficial insects, viruses, bacteria, fungi and other organisms), (4) chemical ecology and behavior, (5) population dynamics (includes evolutionary studies), and (6) fundamental basis of pesticide toxicity and resistance.

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Central Arkansas Conway, AR 72035 Title: Leaf-Trenching by Cabbage Loopers: Identification of Chemical Stimulant	D. Dussourd D. Wiemer	93-37302-9507	\$ 90,000	09/15/93- 09/30/95
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Oxidative Responses to Insect Herbivory: Implications for Host Plant Suitability	G. Felton	93-37302-9571	\$ 161,048	09/15/93- 09/30/96
University of Arizona Tucson, AZ 85721 Title: Second International Symposium on Molecular Insect Science	H. Hagedorn	93-37302-8879	\$ 5,000	07/15/93 07/31/94
University of Arizona Tucson, AZ 85721 Title: Selective Use of Occupied Hosts in Two Tephritid Flies	D. Papaj	93-37302-9126	\$ 170,000	09/01/93- 08/31/96
University of Arizona Tucson, AZ 85721 Title: Physiology of the Manduca sexta Diazepam Binding Inhibitor Peptide Homolog	M. Snyder	93-37302-9595	\$ 76,844	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Arizona Tucson, AZ 85721 Title: Population Genetics of Pyrethroid Resistance in <i>Heliothis virescens</i>	M. Taylor	93-37302-9505	\$ 97,000	09/15/93-09/30/96
USDA, ARS, Pacific West Area Albany, CA 94710 Title: Serological Study of Predators of <i>Bemisia tabaci</i> , <i>Pectinophora gossypiella</i> and <i>Lygus hesperus</i>	S. Naranjo J. Hagler T. Henneberry	93-37302-8966	\$ 110,000	09/15/93-09/30/95
The Regents of the University of California Berkeley, CA 94720 Title: New Symbiotic Associations Among a Pine-Pathogenic Fungus and its Insect Vectors	D. Wood T. Gordon	93-37302-9594	\$ 180,000	09/15/93-09/30/96
The Regents of the University of California Berkeley, CA 94720 Title: AcMNPV Infection of Larval Lepidopteran Midguts	L. Volkman	93-37302-9282	\$ 165,000	09/01/93-08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Mapping Defensive Behavior Quantitative Trait Loci in Africanized Bees	R. Page	93-37302-8880	\$ 43,000	08/01/93-07/31/94

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Riverside, CA 92521 Title: Transgenic Insect-Resistant Brassica with Glossy Wax Genes from Arabidopsis	J. Trumble	93-37302-9077	\$ 120,000	09/15/93- 09/30/95
USDA/ARS Northern Plains Area Fort Collins, CO 80525 Title: Use of Insect Chitinolytic Enzymes for Host Plant Resistance and Biological Control	K. Kramer S. Muthukrishnan	93-37302-9127	\$ 110,000	09/15/93- 09/30/95
Colorado State University Ft. Collins, CO 80523 Title: Structure of Grasshopper Communities within the Great Plains Landscape	T. Holtzer W. Kemp M. Carter	91-37302-6227	\$ 75,000	09/01/91- 08/31/94
University of Delaware Newark, DE 19716 Title: Variation in Diabroticite Cucurbitacin Sensitivity	D. Tallamy	93-37302-9026	\$ 165,000	09/01/93- 08/31/96
University of Florida Gainesville, FL 32611 Title: Analysis of Insect Mycopathogen Host-Insect Interactions	D. Boucias J. Pendland	91-37302-6187	\$ 101,000	07/01/91- 06/30/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Florida Gainesville, FL 32611 Title: Evaluating opd as a Potential Selectable Marker for Transgenic Arthropods	J. Presnail M. Hoy	93-37302-9078	\$ 88,689	09/15/93- 09/30/95
USDA/ARS South Atlantic Area Athens, GA 30613 Title: Gene-Transfer Vector Analysis in Insects of Economic Importance	A. Handler	93-37302-9027	\$ 110,000	09/15/93- 09/30/96
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Characterization of Disease-inducing Secretions Produced by Root-knot Nematodes	R. Hussey	93-37302-8967	\$ 165,000	09/15/93 09/30/96
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Identification of Bacillus thuringiensis Receptor Proteins	M. Adang	91-37302-6277	\$ 55,000	09/01/91- 08/31/94
University of Idaho Moscow, ID 83843 Title: Spatial and Temporal Dynamics in Tritrophic (Plant, Insect Herbivore, Biological Control Agent) Interactions	S. Quisenberry D. Schotzko G. Knudsen J. Johnson	93-37302-9305	\$ 110,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Cytoplasmic Incompatibility in Insects	H. Robertson T. Karr	91-37302-6766	\$ 70,000	09/15/91- 09/30/94
USDA/ARS Mid-West Area Peoria, IL 61604 Title: Structure and Gene Expression of an Insect Bioregulator from Euplectrus sp.	T. Coudron W. Rice	93-37302-9306	\$ 106,000	09/15/93- 09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Effects of Increased UV Radiation on Plant-pollinator Interactions	J. Conner G. Robinson	93-37302-9028	\$ 180,000	09/15/93 09/30/96
Kansas State University Manhattan, KS 66506 Title: Transposon-Mediated Molecular Cloning and Germline Transformation in Beetles	R. Denell R. Beeman	92-37302-7605++	\$ 70,000	08/01/92- 07/31/94
Kansas State University Manhattan, KS 66506 Title: Plodia Proteinases and their Role in Bacillus Thuringiensis Resistance	B. Oppert	93-37302-9570	\$ 110,000	09/15/93- 09/30/95

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National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803 Title: Plasticity in Host Use and Mate Choice in Fall Armyworm Host Strains	D. Pashley	93-37302-9128	\$ 70,000	09/01/93-08/31/94
University of Southwestern Louisiana Lafayette, LA 70504 Title: Endocrine Regulation of Structure and Function in Insect Malpighian Tubules	J. Spring B. Felgenhauer	93-37302-9611	\$ 100,000	09/15/93-09/30/95
University of Massachusetts Amherst, MA 01003 Title: Bacterial Association of Apple Maggot and Mediterranean Fruit Flies	R. Prokopy	92-37302-7683++	\$ 70,000	09/01/92-08/31/94
University of Massachusetts Amherst, MA 01003 Title: Mechanisms of Disrupting Pheromone Communication: The Pink Bollworm as a Model	R. Carde	93-37302-9176	\$ 110,000	09/15/93-09/30/95
University of Maryland, Baltimore County Baltimore, MD 21228 Title: Mating Peptides from Male Corn Earworm That Deplete Sex Pheromone in Females	T. Kingan A. Raina	93-37302-8968	\$ 62,000	09/15/93-09/30/94

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National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Individual Awardee Belleville, MI 48111 Title: Dynamics of Plant Sensitivity, Defoliation, CO ₂ , and Ozone on Insect Performance	J. Stoyenoff	93-37302-9178	\$ 69,607	09/15/93- 09/30/95
USDA, ARS Beltsville Area Beltsville, MD 20705 Title: Mate-Finding, Dispersal, and the Success of Biological Control Introductions	K. Hopper	93-37302-9432	\$ 120,000	09/15/93- 09/30/95
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Genetic Diversity of Feral and Commercial Honey Bee Populations in the U.S.	W. Sheppard N. Schiff	93-37302-9175	\$ 120,000	09/15/93 09/30/95
University of Maryland College Park, MD 20742 Title: Geographic Structure of Insect Pest Populations in Managed and Natural Systems	G. Roderick P. Follett	93-37302-9129	\$ 110,000	09/01/93- 08/31/95
University of Maryland College Park, MD 20742 Title: Nuclear Genes for the Systematics of Noctuid Pests	C. Mitter J. Regier R. Poole	93-37302-8981	\$ 140,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: A Nematode-Host Physiology Model for Nutrition-Based Management Strategy	H. Melakeberhan	93-37302-9177	\$ 100,000	09/15/93-09/30/95
Michigan State University East Lansing, MI 48824 Title: Genetic Basis of Baculovirus Host-Range Determination	S. Thiem	93-37302-9573	\$ 110,000	09/15/93-09/30/95
Michigan State University East Lansing, MI 48824 Title: Causes of Resistance to Bacillus thuringiensis Toxicity in Colorado Potato Beetle	C. Koller L. Bauer M. Whalon R. Hollingworth	93-37302-9360	\$ 120,000	09/15/93-09/30/95
Herbert H. & Grace A. Dow Foundation Midland, MI 48640 Title: Effects of Tree Life History, Abiotic Stress, and Defoliation on Tree Resistance to Folivores	D. Herms J. Nitao M. Nair W. Mattson	93-37302-9506	\$ 180,000	09/15/93-09/30/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Identifying Resistance to Hopperburning Plant Responses to Empoasca Leafhoppers	E. Backus	91-37302-6191	\$ 110,000	07/01/91-06/30/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Montana Missoula, MT 59812 Title: Physiological Genetics of Plant Resistance in Plant-Pathogen-Herbivore Interactions	D. Siemens	93-37302-9572	\$ 90,000	09/15/93-09/30/95
University of North Carolina at Chapel Hill Chapel Hill, NC 27599-4100 Title: Biosynthetic Products of the Insect Corpus Allatum	N. Granger	93-37302-9130	\$ 100,000	09/01/93-08/31/95
North Carolina State University Raleigh, NC 27695-7003 Title: Characterization of a Nematode-responsive Plant Gene Promoter	C. Opperman M. Conkling	92-37302-7640++	\$ 75,000	08/15/92-08/31/94
North Carolina State University Raleigh, NC 27695-7514 Title: Effects of Natural Enemies on Pest Adaptation to Resistant Crops	G. Kennedy F. Gould	91-37302-6291++	\$ 70,000	09/01/91-08/31/94
North Carolina State University Raleigh, NC 27695-7514 Title: Studies of Insect Epoxide Hydrolase	R. Linderman R. Roe	93-37302-9079	\$ 180,000	09/01/93-08/31/96

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National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Dartmouth College Hanover, NH 03755 Title: The Molecular Biology of Ecdysone and Juvenile Hormone Action	E. Berger	93-37302-9009	\$ 60,000	09/01/93- 08/31/94
Board of Regents University of Nevada System Reno, NV 89557 Title: Enantioselective Biosynthesis of Pine Bark Beetle (<i>Ips</i> spp.) Pheromone Compounds	S. Seybold	93-37302-8926	\$ 90,000	08/01/93- 07/31/95
Ohio University Athens, OH 45701 Title: Eclosion Hormone in Insects: Activity and Evolution	F. Horodyski	93-37302-9002	\$ 110,000	09/01/93 08/31/95
Research Foundation of State University of New York Binghamton, NY 13902 Title: Simultaneous Effects of Allelochemicals and Temperature on Insects	N. Stamp	93-37302-9226	\$ 100,000	09/15/93- 09/30/95
Cornell University Ithaca, NY 14853 Title: Characterization of a Cytochrome P450 Responsible for Pyrethroid Resistance	J. Scott	93-37302-9000	\$ 110,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Efficient Storage of Chrysoperla rufilabris to Enhance	M. Tauber C. Tauber Augmentative Biological Control	93-37302-9001	\$ 77,000	09/01/93- 08/31/95
Cornell University Ithaca, NY 14853 Title: Resistance Management for BT Endotoxins: Testing of a Model System	E. Earle R. Roush A. Shelton	91-37302-6199	\$ 140,000	07/01/91- 06/30/95
Cornell University Ithaca, NY 14853 Title: Genetic Control and Field Efficacy of Acylsugar-mediated Multiple Pest Resistance	M. Mutschler	93-37302-9316	\$ 110,000	09/01/93 08/31/95
Cornell University Ithaca, NY 14853 Title: Molecular Biology of Polyphenol Oxidase-Based Plant Defense	J. Steffens W. Tingey	91-37301-6571	\$ 110,000	09/01/91- 08/31/95
Ohio State University Research Foundation Columbus, OH 43210 Title: Behavior, Physiology, and Correlation During Selection for Insecticide Resistance	C. Hoy F. Hall	91-37302-6200	\$ 110,000	07/01/91- 06/30/95

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Miami University Oxford, OH 45056 Title: Regulation of Insect Cold-Hardiness Using Ice Nucleating Active Bacteria	R. Lee M. Lee	93-37302-9003	\$ 180,000	09/01/93- 08/31/96
Pennsylvania State University University Park, PA 16802-1003 Title: Pathogen Tolerance in <i>Lymantria dispar</i> : Genetic and Maternal Effects Components	J. Frazier	91-37302-6292++	\$ 70,000	08/01/91- 07/31/94
Pennsylvania State University University Park, PA 16802-1003 Title: Financial Support for the 7th Annual Penn State Symposium in Plant Physiology	J. Schultz J. Shannon	93-37302-9174	\$ 5,000	08/15/93- 08/31/94
Pennsylvania State University University Park, PA 16802-1003 Title: Purification of the Cry1A <i>Bacillus Thuringiensis</i> Toxin Binding Protein(s) from Gypsy Moth	W. McCarthy	93-37302-9132	\$ 110,000	09/01/93- 08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Enzymatic Interactions in Molting and Encapsulation: Targeting Weak Links	D. Cox-Foster	93-37302-9131	\$ 180,000	09/01/93- 08/31/96

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National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Diabroticite and Erwinia Management: Integrating Semiochemicals and Serology	S. Fleischer F. Gildow F. Lukezic	93-37302-9179	\$ 110,000	09/01/93- 08/31/95
University of South Carolina Columbia, SC 29208 Title: Preference/Performance Relationships in a Leaf-Mining Beetle	T. Mousseau	93-37302-9307	\$ 71,012	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Juvenile Hormone Regulated Gene Expression: Mechanisms and Significance	J. Bradfield	92-37302-7659++	\$ 70,000	09/01/92 08/31/94
Texas A&M Research Foundation College Station, TX 77843 Title: A Novel Approach to the Regional Management of Arthropod Pests	L. Wilson P. Trichilo	93-37302-8928	\$ 120,000	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Comparing Co-evolved and Novel Host-Parasite Interactions for Biological Control	R. Wiedenmann	93-37302-8927	\$ 90,000	09/01/93- 08/31/95

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National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas A&M Research Foundation College Station, TX 77843 Title: Host Relationships and Sex Ratio Distorters in Whitefly Autoparasitoids	M. Hunter	93-37302-9029	\$ 70,000	09/01/93-08/31/94
Southern Methodist University Dallas, TX 75725 Title: Molecular Genetics of Insect Steroidogenesis	T. Sliter	93-37302-9080	\$ 70,000	09/01/93-08/31/94
University of Utah Salt Lake City, UT 84112 Title: Insect/Plant Interactions in Genetically Characterized Soybeans: A Model System	L. Terry K. Lark	93-37302-9180	\$ 110,000	09/15/93-09/30/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: International Conference on Population Dynamics, Behavior, and Control of Forest Insects	S. Salom F. Ravlin	93-37302-9133	\$ 2,000	09/01/93-08/31/94
University of Vermont and State Agricultural College Burlington, VT 05405 Title: The 1993 International Conference on Thysanoptera: Towards Understanding Thrips Management	B. Parker	93-37302-8782	\$ 6,800	06/01/93-05/31/94

National Research Initiative Competitive Grants Program
Entomology/Nematology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Washington State University Pullman, WA 99164-5045 Title: Defense Reactions in Conifers: Oleoresinosis	R. Croteau	91-37302-6311	\$ 70,000	08/01/91-07/31/94
University of Washington Seattle, WA 98195 Title: Detection of Behaviorally Relevant Neurons by Cyclic GMP Immunocytochemistry	J. Truman	93-37302-9225	\$ 110,000	09/01/93-08/31/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: The Role of Membrane Glycoproteins in Thrips Transmission of Tomato Spotted Wilt Virus	T. German	91-37302-6295++	\$ 70,000	07/01/91-06/30/94

Total : \$ 7,372,000

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PLANT SYSTEMS

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ALCOHOL FUELS

This program supports research activities related to the physiological, microbiological, biochemical, and genetic processes and mechanisms controlling the biological conversion of agriculturally important biomass material to alcohol fuels and industrial hydrocarbons. Studies on factors which limit efficiency of biological production of alcohol fuels and means of overcoming these limitations are also encouraged.

National Research Initiative Competitive Grants Program
Alcohol Fuels

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Identification and Characterization of Sugar Transporters in Pichia Species	L. Bisson	93-37308-9085	\$ 120,000	09/15/93- 09/30/95
Board of Trustees at the University of Illinois Chicago, IL 60612-7227 Title: Enzymology of Lignocellulose Degradation By Phanerochaete Chrysosporium	M. Sinnott	93-37308-9387	\$ 180,000	09/15/93- 09/30/96
University of Massachusetts Amherst, MA 01003 Title: Metabolic Engineering of Cellulolytic Clostridia for Ethanol Production	S. Leschine	93-37308-9007	\$ 58,000	09/01/93 08/31/94
Rutgers, The State University Piscataway, NJ 08855-1089 Title: Fuel Alcohol from Zymomonas: Secretion of Hydrolases	D. Eveleigh	93-37308-9008	\$ 120,000	09/01/93- 08/31/95
University of Rochester Rochester, NY 14627-0140 Title: Synergism and Interaction Between Clostridium thermocellum Major Cellulosome Components, Ce1S and Ce1L	J. Wu	93-37308-8988	\$ 53,000	09/01/93- 08/31/94

National Research Initiative Competitive Grants Program
Alcohol Fuels

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Forest Products Laboratory USDA, Forest Service Madison, WI 53705 Title: Enzymatic Hydrolysis of Wood Pretreated with Sulfur Dioxide Gas	A. Baker	93-37308-9165	\$ 44,000	09/01/93- 08/31/94

Total : \$ 575,000

PLANT SYSTEMS

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PLANT GENOME

This competitive grant program is part of the USDA Plant Genome Research Program. The Plant Genome Research Program was established in order to facilitate development of new or improved crop and forest species, thereby promoting sustainability and profitability of plant production and improvement of quality of food, fiber, and feed. To accomplish these goals, the program gives high priority to research for construction of genomic maps, and for detailed studies of specific regions of genomes, genes and genetic processes. The program also supports research on development of new methods or innovative approaches that have potential application to genome mapping, gene isolation or gene transfer in crop and forest species.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Transformation and Foreign Gene Expression Studies Using the Gene Gun	H. Daniell	93-37311-9455	\$ 10,648	09/15/93- 09/30/94
University of Alabama Tuscaloosa, AL 35487-0104 Title: A Novel Mechanism for Ribosomal Protein Modulation: On/Off Splicing	K. Redman M. Johnson	93-37301-8942	\$ 120,000	08/15/93- 08/31/95
Individual Awardee Benicia, CA 94510 Title: Regulation of Glandular Trichome-based Insect Resistance in Lycopersicon	S. Colby	93-37301-9504	\$ 82,000	09/15/93 09/30/95
PSWFRES USDA, Forest Service Berkeley, CA 94701 Title: Codominant PCR-based Markers for Pines and Other Conifers	D. Harry D. Neale	93-37300-8785	\$ 200,000	08/01/93- 07/31/96
PSWFRES USDA, Forest Service Berkeley, CA 94701 Title: Molecular Marker and Quantitative Trait Mapping in Douglas-Fir	D. Neale N. Wheeler	93-37300-8759	\$ 223,000	09/01/93- 08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Promoters to Express Ac Transposase for Efficient Tagging Systems	S. Scofield	93-37300-8763	\$ 121,400	08/01/93-07/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: Map-based Cloning in Rice	P. Ronald	93-37300-8761	\$ 200,000	09/01/93-08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Research Collaboration Group on Molecular Mapping in Wheat and Its Relatives	C. Qualset	92-37310-7664++	\$ 115,155	09/01/92-08/31/94
The Regents of the University of California Davis, CA 95616-8671 Title: Mapping Genetic Determinants of Host-bacteria Interactions in Common Bean	P. Gepts	93-37300-8762	\$ 250,000	09/01/93-08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Recombination Between Homoeologous Chromosomes in Wheat	J. Dvorak	93-37300-8764	\$ 274,000	08/01/93-07/31/96

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Transposon Mutagenesis in Tomato	J. Yoder	93-37301-9430	\$ 118,500	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: ACC Malonyltransferase: Isolation, Characterization and Molecular Cloning	S. Yang	93-37304-9366	\$ 115,000	09/15/93- 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: QTL Analysis of Developmental Traits in Wild Rice	J. Kohn	93-37300-8765	\$ 40,000	07/15/93 07/31/94
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: An Analysis of Floral Regulatory Genes in Maize	R. Schmidt M. Yanofsky	93-37304-8910	\$ 120,000	08/01/93- 07/31/95
DNA Plant Technologies, Inc. Oakland, CA 94608 Title: A Set of Maize Lines Carrying Ac at Mapped Locations Dispersed in the Genome	H. Dooner	93-37300-8760	\$ 130,000	07/01/93- 06/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Riverside, CA 92521 Title: Transgenic Insect-Resistant Brassica with Glossy Wax Genes from Arabidopsis	J. Trumble	93-37302-9077	\$ 120,000	09/15/93- 09/30/95
The Regents of the University of California Riverside, CA 92521 Title: Molecular and Cell Biology of Oil Bodies in Maize and Brassica	A. Huang	91-37301-6370++	\$ 67,000	08/01/91- 07/31/94
Yale University New Haven, CT 06511 Title: Molecular and Cellular Analysis of a Pro- and Cys-rich Protein Family in the Pistil	A. Cheung	93-37304-9438	\$ 120,000	09/15/93 09/30/95
University of Florida Gainesville, FL 32611 Title: Chromatin Structure and Gene Expression in Plant	R. Ferl	91-37301-6372++	\$ 73,000	09/01/91- 08/31/94
University of Florida Gainesville, FL 32611 Title: Molecular and Physiological Genetics of Sucrose Metabolizing Enzymes in Maize Endosperm	G. Agrios P. Chourey	91-37301-6343	\$ 120,000	08/15/91- 08/31/95

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Florida Gainesville, FL 32611 Title: Viviparous-1 Mediated Repression of Alpha Amylase Genes in Developing aleurone	D. McCarty I. Vasil	93-37301-9357	\$ 210,000	09/15/93- 09/30/96
Florida State University Tallahassee, FL 32306 Title: Targeting of DNA Integration to Specific Sites in Plant Chromosomes	G. Bates	93-37301-9569	\$ 115,000	09/15/93- 09/30/95
USDA/ARS South Atlantic Area Athens, GA 30613 Title: Stability of QTL Mapping in Maize Under Varying Environmental Stresses	C. Stuber	93-37300-8766	\$ 200,000	09/01/93 08/31/96
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Phytochrome Gene Family in Tomato	L. Pratt M. Cordonnier-Pratt	93-37301-8779	\$ 140,000	07/15/93- 07/31/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Protoplast-Mediated Transformation of Peanut for Virus Resistance	J. Demski R. Jarret	93-37300-8767	\$ 150,000	07/15/93- 07/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Phytochrome and Potential Photomorphogenic Loci in the Grasses	M. Cordonnier-Pratt L. Pratt	93-37304-9362	\$ 120,000	09/15/93- 09/30/95
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Development, Genomic Diversity, and Gene Expression in Aposporous Genotypes	P. Ozias-Akins W. Hanna	93-37304-9363	\$ 120,000	09/15/93- 09/30/95
University of Hawaii, Manoa Honolulu, HI 96822 Title: Genetic Transformation of Grain Legumes for Improved Protein Quality	S. Sun	93-37301-8780	\$ 120,000	08/01/93 07/31/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Isolation and Characterization of the Maize Gene Sugary1, a Determinant of Starch Composition in Kernels	M. James A. Myers	93-37301-8671	\$ 60,000	07/01/93- 06/30/94
Iowa State University of Science and Technology Ames, IA 50011 Title: Selection for Second Site Mutations in the Wound-Induction Pathway	R. Thornburg	91-37301-6208	\$ 120,000	07/01/91- 06/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011 Title: Genetic Organization of Resistance to Puccinia coronata in Avena	M. Lee R. Wise	93-37300-8770	\$ 180,000	08/01/93- 07/31/96
Iowa State University of Science and Technology Ames, IA 50011 Title: Phytochrome mRNA Degradation: Cis-elements, Factors, and Pathway	J. Colbert	93-37304-8944	\$ 120,000	08/15/93- 08/31/95
University of Idaho Moscow, ID 83843 Title: Transposable Element-Mediated Dissection of Protein Structure and Function	C. Weil	93-37301-9358	\$ 113,000	09/15/93 09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Cis- and Trans-Acting Functions Mediating Ti Plasmid Transfer	S. Farrand	93-37301-8943	\$ 130,000	08/15/93- 08/31/95
USDA/ARS Mid-West Area Peoria, IL 61604 Title: High Resolution Mapping of the M1-a Disease Resistance Locus in Barley	R. Wise	93-37300-8768	\$ 151,000	08/01/93- 07/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Molecular Characterization of CaBP-22, a Leaf-Specific, EF-Hand Ca ²⁺ -Binding Protein	R. Zielinski	93-37304-8986	\$ 140,000	09/01/93- 08/31/95
Indiana University Bloomington, IN 47402 Title: Molecular Cloning of Disease Resistance Genes from Arabidopsis and Soybean	R. Innes	93-37303-9136	\$ 80,000	09/15/93- 09/30/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Nuclear Matrix and Matrix-Attachment Regions (MARs) in Higher Plants	Z. Avramova	93-37300-8769	\$ 230,000	08/01/93 07/31/96
Purdue Research Foundation West Lafayette, IN 47907 Title: Gene Targeting of Plant Cells	T. Hodges L. Lyznik	91-37301-6375	\$ 120,000	09/01/91- 08/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Cell Biology of T-DNA Transfer to Plant Cells	S. Gelvin	93-37301-9427	\$ 120,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Kansas State University Manhattan, KS 66506 Title: The Sub-Arm Aneuploids of Common Wheat	B. Gill	91-37300-6499	\$ 100,200	08/01/91- 07/31/95
Kansas State University Manhattan, KS 66506 Title: Development of a High Density Chromosome Map Using Region-Specific Libraries	S. Hulbert D. Delaney B. Gill	92-37300-7746++	\$ 52,500	09/01/92- 08/31/95
Kansas State University Manhattan, KS 66506 Title: Analysis of the Rp1 and Rp3 Loci of Maize	S. Hulbert	91-37303-5883	\$ 140,000	08/01/91 07/31/95
University of Massachusetts Boston, MA 02125 Title: Genome Evolution and the Organization of Disease Resistant Genes in the Compositae	R. Kesseli	93-37300-8772	\$ 200,000	08/01/93- 07/31/96
Massachusetts Institute of Technology Cambridge, MA 02139 Title: Repeat-Induced Gene Silencing in Arabidopsis	E. Signer	93-37304-8945	\$ 70,000	08/15/93- 08/31/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maryland, Baltimore County Baltimore, MD 21228 Title: Hormonal Control of Gene Expression During Seed Maturation	M. Bustos	93-37304-9439	\$ 100,000	09/15/93- 09/30/95
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: An Integrated Microsatellite, RFLP, and Conventional Linkage Map of Soybean	P. Cregan J. Specht R. Shoemaker	93-37300-8771	\$ 300,000	08/01/93- 07/31/96
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Tagging Genes which Control Chilling Requirement in a Woody Perennial	L. Rowland	93-37300-9123	\$ 118,422	09/01/93 08/31/95
Federation of American Societies for Experimental Biology Bethesda, MD 20814 Title: FASEB Summer Research Conference: Signal Transduction in Plants	C. Lamb C. Ryan	93-37301-8634	\$ 5,000	06/15/93- 06/30/94
Michigan State University East Lansing, MI 48824 Title: Control of mRNA Stability in Dicotyledonous Plants	P. Green	93-37301-9359	\$ 210,000	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM

Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Genetics of Inflorescence Development in Maize and Teosinte	J. Doebley	93-37300-8773	\$ 212,200	08/01/93- 07/31/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Molecular Analysis of Maize Centromeres	J. Birchler	93-37301-8781	\$ 120,000	08/01/93- 07/31/95
Montana State University Bozeman, MT 59717 Title: Molecular Markers to Correct Germplasm Deficiencies in Wheat and Barley	T. Blake L. Talbert	93-37300-8774	\$ 250,000	08/01/93 07/31/96
North Carolina State University Raleigh, NC 27695-7003 Title: Characterization of a Nematode-responsive Plant Gene Promoter	C. Opperman M. Conkling	92-37302-7640++	\$ 75,000	08/15/92- 08/31/94
North Carolina State University Raleigh, NC 27695-7003 Title: Genome Map Assisted Plant Breeding (GMAPB) for Forest Tree	B. Liu D. O'Malley F. Bridgewater D. Grattapaglia	93-37300-8839	\$ 100,000	09/01/93- 08/31/95

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7003 Title: The Glossy-15 Gene of Maize, a Cell-specific Regulator of Leaf Epidermal Traits	R. Dewey P. Sisco D. Danehower	93-37304-8916	\$ 164,000	08/01/93- 07/31/96
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Molecular Mapping of Tan Spot Resistance Genes in Wheat	J. Anderson L. Francl	93-37311-9388	\$ 50,000	09/15/93- 09/30/95
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Exploring the Interface of Qualitative and Quantitative Genetics	P. Baenziger Y. Yen	93-37300-8817	\$ 201,000	08/01/93 07/31/96
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Gordon Research Conference on Plant Cell & Tissue Culture: Plant Transgenes-Tools for Discovery and Design	P. Maliga	93-37301-8787	\$ 5,000	06/01/93- 05/31/94
Rutgers, The State University Piscataway, NJ 08855-1089 Title: A Transgenic Approach to Dissect Light Regulation of the Plastid psbD/C Operon	P. Maliga	93-37301-8822	\$ 140,000	09/01/93- 08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003	R. Cantrell	93-37311-9447	\$ 49,013	09/15/93- 09/30/95
Title: Use of RAPD Markers to Determine the Genetic Diversity of Gossypium Germplasm Derived from Interspecific Hybridization				
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003	G. Phillips G. Kuehn S. Bagga	93-37301-9429	\$ 110,000	09/15/93- 09/30/95
Title: Isolation of Genes Coding for Plant Polyamine Biosynthetic Enzymes				
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003	R. Rajasekharan J. Kemp	93-37304-9434	\$ 100,000	09/15/93 09/30/95
Title: Lysophosphatidic Acid Acyltransferase: Enzyme and Gene Isolation from Soybean				
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	S. Howell	93-37300-8775	\$ 200,000	09/01/93- 08/31/96
Title: Isolation of Genes Involved in Cytokinin Responses in Arabidopsis				
Cornell University Ithaca, NY 14853	S. McCouch	93-37300-8703	\$ 250,000	07/01/93- 06/30/96
Title: High-Density Genetic Mapping of the Rice Genome Based on Sequence Tagged Microsatellite Sites				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Genome Mapping & Gene Tagging in Apple	S. Brown H. Aldwinckle N. Weeden	93-37300-8776	\$ 276,000	07/01/93- 06/30/96
Cornell University Ithaca, NY 14853 Title: Chromosome-specific Libraries of Tomato	E. Earle	93-37300-8778	\$ 160,000	09/01/93- 08/31/95
Cornell University Ithaca, NY 14853 Title: Biological Projectiles for Delivery of High Molecular Weight DNA to Plants	J. Kikkert J. Sanford	93-37300-8777	\$ 151,000	08/01/93 07/31/95
Cornell University Ithaca, NY 14853 Title: A Structural and Transcriptional Analysis of the S-Locus Region of Brassica	J. Nasrallah	92-37301-7828++	\$ 75,000	09/01/92- 08/31/94
Cornell University Ithaca, NY 14853 Title: Regulation of Synthesis of Plant Mitochondrial Proteins	M. Hanson	93-37301-8841	\$ 60,000	09/01/93- 08/31/94

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Function and Regulation of Chloroplast REC-A Protein	A. Jagendorf	91-37301-6421	\$ 120,000	09/01/91-08/31/95
Cornell University Ithaca, NY 14853 Title: Genetic Control and Field Efficacy of Acylsugar mediated Multiple Pest Resistance	M. Mutschler	93-37302-9316	\$ 110,000	09/01/93-08/31/95
New York University New York, NY 10003 Title: Characterization of Two Fd-GOGAT Genes and Their Roles in Photorespiration	K. Coschigano	93-37306-9285	\$ 70,000	09/15/93-09/30/95
Case Western Reserve University Cleveland, OH 44106 Title: Regulation and Mechanism of the Self-Incompatibility Response of Flowering Plants	V. Dzelzkalns	93-37304-9365	\$ 112,000	09/15/93-09/30/95
Oregon State University Corvallis, OR 97331 Title: A Multifunctional DNA Binding Protein Required for Gene Transfer to Plants	L. Ream	93-37301-8728	\$ 120,000	07/01/93-06/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Oregon State University Corvallis, OR 97331 Title: Floral Homeotic Genes for Genetic Engineering of Sterility in Populus	S. Strauss W. Rottmann	93-37301-9425	\$ 120,000	09/15/93- 09/30/95
Duquesne University Pittsburgh, PA 15282 Title: Regulatory Mutants of the Maize R Locus	M. Alleman	93-37301-8878	\$ 140,000	08/01/93- 07/31/95
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: 1993 Gordon Research Conference on Plant Molecular Biology Signal Transduction and Membrane Proteins	W. Briggs	93-37301-8705	\$ 5,000	06/01/93 05/31/94
Clemson University Clemson, SC 29634-5326 Title: Chromosome Mapping in Peach and its Application to Fruit Quality Maintenance	W. Baird A. Abbott R. Ballard W. Bridges	93-37300-8818	\$ 200,000	08/01/93- 07/30/96
Clemson University Clemson, SC 29634-5326 Title: Characterization of the 12-Desaturase	G. Powell A. Abbott	93-37301-9426	\$ 112,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas A&M Research Foundation College Station, TX 77843 Title: Construction of an RFLP-Based Genetic Map of Sorghum Recombinant Inbred Lines	G. Hart	93-37300-8820	\$ 121,900	09/01/93-02/28/95
Texas A&M Research Foundation College Station, TX 77843 Title: Physical Mapping and Map-Based Cloning in Polyploids: Cotton as a Model System	R. Wing A. Paterson	93-37300-8819	\$ 250,000	09/01/93-08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Conifer Transformation with Shoot Apices and Agrobacterium	R. Newton	93-37300-8859	\$ 153,000	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: A Peroxidase Gene Induced During Nodule Initiation in Medicago truncatula	D. Cook K. VandenBosch	93-37305-9230	\$ 110,000	09/15/93-09/30/95
Texas Tech University Lubbock, TX 79409-1035 Title: Tagging Drought Tolerance Traits in Grain Sorghum Using Molecular Markers	H. Nguyen D. Rosenow	93-37300-8821	\$ 175,300	09/01/93-08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Virginia Polytechnic Institute and State University Blacksburg, VA 24061 Title: Assessment of Barley Germplasm Using Nuclear and Organellar Molecular Markers	M. Saghai Maroof	93-37300-8840	\$ 150,000	08/01/93-07/31/96
Washington State University Pullman, WA 99164-5045 Title: High Resolution Map of the Barley Sub-Telomeric Region Including Rpgl Gene	A. Kleinhofs	93-37300-8860	\$ 200,000	07/15/93-07/31/96
Washington State University Pullman, WA 99164-5045 Title: Genetic Engineering of Non-Host Resistance in Plants	L. Hadwiger	93-37301-9503	\$ 115,000	09/15/93-09/30/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Molecular and Biochemical Analysis of the Maize Brittle-1 Gene	T. Sullivan	91-37301-6380	\$ 120,000	08/01/91-07/31/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Molecular and Biochemical Analysis of Ubiquitin Conjugating Enzymes in Higher Plants	R. Vierstra	91-37301-6290++	\$ 79,000	07/01/91-06/30/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Plant Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Tests for Ac/Ds-Induced Gene Conversion in Maize	J. Kermicle W. Eggleston	91-37301-6379	\$ 140,000	09/01/91- 08/31/95

Total : \$ 12,126,238

MARKETS, TRADE AND POLICY

The purpose of this Division is two-fold. One is to support research to enhance the marketability and competitiveness of U.S. agricultural, forest, and fish products in global marketing. Research includes development and/or application of methodologies to assess product preference, demand, and utilization by consumers and factors affecting competitiveness including resource availability, costs, new technologies, and market structure. Public policy research is supported that evaluates the market development and competitiveness impacts and alternatives of fiscal, monetary, trade promotion, sustainable, human resource, research, and other programs and regulations.

The second purpose of the Division is to develop and/or apply research methodologies to problems affecting economic welfare and quality of living of rural communities and people by examining the effects of international, national, and local policies. Research involves comparative analysis of the impacts of policy options and alternatives on natural resource use, population distribution, and the structure of rural society. The goal is to develop new economic development opportunities to sustain rural communities and people in the United States.

MARKETS ASSESSMENTS, COMPETITIVENESS, AND TECHNOLOGY ASSESSMENT

The goal of this program is to support research aimed at assessing market preferences, demand, and utilization for various agricultural and forest products and commodities; determining the ability of the U.S. to compete for these markets; and assessing the impacts of new products and production technologies on U.S. competitiveness, the environment, and rural economies. Research was specifically encouraged to: (1) identify, describe and quantify the size of potential international markets; (2) ascertain the ability of the U.S. to compete in particular agricultural global markets; and (3) determine the benefits and costs of adopting new products and/or production methods for agricultural and forest materials produced using sustainable and alternative agricultural and forestry practices.

National Research Initiative Competitive Grants Program
Markets, Competitiveness & Technology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Arizona Tucson, AZ 85721 Title: Competitiveness of Fresh Vegetables Producers and Shippers in U.S. and Mexican Markets	P. Wilson G. Thompson	93-37400-9518	\$ 150,000	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: Marketing Orders: An Assessment and a Case Study of Competitiveness	R. Green A. Havenner	93-37400-9584	\$ 95,000	09/15/93- 09/30/95
University of Connecticut Storrs, CT 06269-2086 Title: Global Competitors in the U.S. Beer and Bottled Water Industries: A Multidisciplinary Analysis	R. Cotterill S. Jain	93-37400-9045	\$ 95,343	09/15/93 09/30/96
USDA, ERS, Agriculture and Rural Economy Division Washington, DC 20005-4788 Title: International Competitiveness of U.S. Agriculture	M. Shane T. Roe	93-37400-9463	\$ 118,720	09/15/93- 09/30/95
University of Delaware Newark, DE 19716 Title: Assessing U.S. Agricultural Market Potentials in China, Hong Kong and Taiwan	C. Halbrendt	93-37400-9373	\$ 110,490	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Markets, Competitiveness & Technology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Florida Gainesville, FL 32611	J. Seale J. Lee M. Brown R. Behr	93-37400-9086	\$ 117,768	09/15/93- 09/30/95
Title: Demand for U.S. Fresh Fruits: A System-wide Approach				
Iowa State University of Science and Technology Ames, IA 50011	S. Sapp H. Jensen	93-37400-9087	\$ 106,745	09/15/93- 09/30/95
Title: Consumer Meat Preferences and Purchasing Patterns in Japan				
Iowa State University of Science and Technology Ames, IA 50011	L. Fulginiti	93-37400-9619	\$ 86,994	09/15/93- 09/30/95
Title: Evaluating U.S. Competitiveness in Wheat, Soybeans and Corn Markets				
Purdue Research Foundation West Lafayette, IN 47907	T. Hertel	93-37400-9149	\$ 66,674	09/15/93- 09/30/94
Title: Economic Growth and U.S. Food Exports to the East Asian Market				
Purdue Research Foundation West Lafayette, IN 47907	P. Abbott	93-37400-9583	\$ 125,000	09/15/93- 09/30/95
Title: Plans and Adjustments: Implications for International Grain Trade Modeling				

National Research Initiative Competitive Grants Program
Markets, Competitiveness & Technology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Sources of Agricultural Productivity Growth: An International Comparative Study	V. Ruttan	93-37400-9150	\$ 97,660	09/01/93- 08/31/96
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Research, Productivity, and Long-Run Sources of Growth in U.S. Agriculture	W. Sundquist P. Pardey J. Alston	93-37400-9151	\$ 124,995	09/01/93- 08/31/94
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: (Conference) Regional and Product Impacts of the North American Free Trade Agreement	J. Houck	93-37400-9241	\$ 7,980	09/15/93 09/30/95
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Export Credit in International Wheat Trade	D. Johnson W. Wilson C. Gustafson	93-37400-9464	\$ 100,000	09/15/93- 09/30/95
Ohio State University Research Foundation Columbus, OH 43210 Title: Structural Determinants of U.S. Competitiveness in the World Soybean Complex	M. Miranda I. Sheldon J. Glauber	93-37400-9462	\$ 100,000	09/15/93- 09/30/95

National Research Initiative Competitive Grants Program
Markets, Competitiveness & Technology

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Langston University Langston, OK 73050 Title: National Symposium on Goat Fiber Production, Processing and Marketing	T. Teh	93-37500-8915**	\$ 1,000	08/01/93-01/31/94
Pennsylvania State University University Park, PA 16802-1003 Title: Enhancing International Value-Added Opportunity for U.S. Hardwoods (in Japan)	P. Smith C. West	93-37400-9167	\$ 76,070	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Enhancing Competitiveness of U.S. Grain/Oilseed Producers in the Mexican Market	S. Fuller	93-37400-9461	\$ 53,252	09/15/93-03/31/95
University of Washington Seattle, WA 98195 Title: China: An Assessment of Potential Timber and Timber Products Markets for the United States	J. Perez-Garcia	93-37400-9517	\$ 82,744	09/15/93-09/30/94
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Advanced Modeling of the North American Pulp and Paper Sector	J. Buongiorno P. Ince	93-37400-9166	\$ 100,000	09/01/93-08/31/94

** Split Funded Award

Total : \$ 1,816,435

RURAL DEVELOPMENT

Rural areas dependent on agriculture, forestry, and other natural resource based industries have been subjected to various forces that reduce their economic vitality. This program calls for theoretical and empirical research to help understand the ways these forces affect economic vitality and evaluate how well public policies might restore the vitality. Research is supported in three general areas: (1) new theoretical and methodological studies to focus on improving the social and economic well-being of rural families and communities at the national, regional and local levels; (2) empirical studies to identify the forces that influence population changes, employment, wage levels and other indicators of social and economic viability; and (3) empirical evaluations of methods and policies to diversify the economies of rural areas, particularly those highly dependent on agriculture, forestry and other natural resource extractive industries.

National Research Initiative Competitive Grants Program
Rural Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Retirement Preparation of Farm Families: Planning for Well-being in Later Life	M. Turner	93-37401-9047	\$ 122,254	09/15/93- 09/30/94
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: The North American Free Trade Agreement: Implications for Rural Employment	M. Killian	93-37401-9046	\$ 126,685	09/01/93- 08/31/96
The Regents of the University of California Berkeley, CA 94720 Title: Poverty in Rural Forest Communities: A Historical and Biographical Assessment	L. Fortmann	93-37401-9374	\$ 50,000	09/15/93 03/31/95
Regents of the University of California Santa Cruz, CA 95064 Title: Sustaining Agricultural Communities, Economies, and Ecologies: Imperial Valley, CA	A. Rudy	93-37401-9048	\$ 35,648	09/01/93- 08/31/94
University of Florida Gainesville, FL 32611 Title: Manufacturing Networks as a Vehicle for Enhancing Competitiveness in Rural Areas	E. Malecki D. Tootle	93-37401-8989	\$ 101,431	08/15/93- 08/31/95

National Research Initiative Competitive Grants Program
Rural Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Purdue Research Foundation West Lafayette, IN 47907 Title: Evaluation of the Impacts of Business Incubators on Local Economic Development:	K. McNamara L. DeBoer	93-37401-8970	\$ 89,049	09/15/93- 09/30/95
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: County-Level Determinants of Economic Growth in the U.S. South	S. Goetz D. Debertin	93-37401-9376	\$ 115,300	09/01/93- 08/31/95
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Public Policies, Economic Restructuring, and Local Outcomes in The Ohio Valley	L. Swanson D. Freshwater	93-37401-8974	\$ 119,700	09/15/93- 09/30/95
The Board of Regents of the University of Michigan Ann Arbor, MI 48109-1248 Title: Promoting Analyses of Rural Development Using PSID Data	G. Duncan	93-37401-9375	\$ 59,070	09/15/93- 09/30/95
University of New Hampshire Durham, NH 03824 Title: Infrastructure Investment and Rural Economic Development	J. Halstead	93-37401-8971	\$ 126,618	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Rural Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: Employment Diversification and Entrepreneurial Opportunities within Rural Areas	R. Heck E. Trzcinski	93-37401-8990	\$ 115,850	09/01/93- 08/31/95
Ohio State University Research Foundation Columbus, OH 43210-1063 Title: Public Policies, Economic Restructuring, and Regional and Local Outcomes	L. Lobao L. Brown	93-37401-8972	\$ 126,296	09/01/93- 08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Rural Multicommunity Partnerships: Implications for State Policies and Programs	B. Cigler	93-37401-9088	\$ 299,573	09/01/93 08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Socioeconomic Impacts of Waste Facility Siting and Management in Rural America	S. Murdock	93-37401-8973	\$ 328,961	09/01/93- 08/31/96

Total : \$ 1,816,435

PROCESSING FOR ADDING VALUE OR DEVELOPING NEW PRODUCTS

The Processing for Adding Value or Developing New Products program area responds to the growing need to enhance the competitive value and quality of U.S. agricultural products. Research in this area builds the scientific base of knowledge to use agricultural and forest materials more fully and effectively in food and non-food products. The program supports both fundamental and applied research on development of new and improved processes and on development of new uses for agricultural commodities. Research to enhance quality of food and non-food products is also supported.

National Research Initiative Competitive Grants Program
Processing for Value-added Products

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Adding Value to Broiler Litter for Increased Consumption by Ruminants	A. Goetsch	93-37500-9152	\$ 163,000	09/15/93- 09/30/96
The Regents of the University of California Berkeley, CA 94720 Title: Enhancement of Wheat Utility Through Transformation Technology	P. Lemaux B. Buchanan	93-37500-9586	\$ 124,000	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: Temperature Dependence of Phase Relationships	D. Reid M. McCarthy	93-37500-9254	\$ 178,000	09/15/93 09/30/96
The Regents of the University of California Davis, CA 95616-8671 Title: Plant Proteinase Inhibitors as Food Processing Aids	N. Haard	93-37500-9089	\$ 178,000	09/15/93- 09/30/96
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Production of Thermostable Xylanases for Pulp Bleaching	K. Eriksson J. Westpheling J. Dean M. Adams	93-37500-9596	\$ 160,000	09/15/93- 03/31/96

National Research Initiative Competitive Grants Program
Processing for Value-added Products

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Institute of Paper Science and Technology Atlanta, GA 30318 Title: Flotation Deinking of Electrostatically-Printed Paper	R. Stratton	93-37500-9251	\$ 88,000	09/15/93- 09/30/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Value-Added Coproducts in Ethanol Production by the Sequential Extraction Process	L. Johnson M. Hojilla-Evangelista D. Myers A. Pometto	93-37500-9379	\$ 160,000	09/15/93- 09/30/96
Agricultural Expt. Station Board of Supervisors, Louisiana State Univ. and A&M College Baton Rouge, LA 70893 Title: Production and Evaluation of Textile Products from Sugar Cane	B. Collier J. Collier	93-37500-9153	\$ 120,000	09/01/93- 08/31/95
University of Massachusetts Amherst, MA 01003 Title: 17o NMR Mobile Water and its Relation to Mold Germination and Bacterial Growth	P. Chinachoti	93-37500-9252	\$ 155,000	09/15/93- 09/30/95
Michigan State University East Lansing, MI 48824 Title: Characterization of Soft Wheat Proteins in Relation to Cookie-Making Quality	P. Wong Ng	93-37500-9520	\$ 150,000	09/15/93- 09/30/96

National Research Initiative Competitive Grants Program
Processing for Value-added Products

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Michigan State University East Lansing, MI 48824 Title: Catalytic Upgrading of Lactic Acid	D. Miller J. Jackson	93-37500-9585	\$ 60,000	09/15/93- 09/30/94
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: A Novel Approach to Poultry Processing	D. Halvorson J. Chaplin S. Noll K. Janni	93-37500-9253	\$ 100,000	09/15/93- 09/30/95
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Reactive Blending of Synthetic and Natural Polymers	M. Bhattacharya	93-37500-9310	\$ 120,000	09/15/93 09/30/95
University of Southern Mississippi Hattiesburg, MS 39406 Title: Lesquerella or Castor Oil??	S. Thames	93-37500-9154	\$ 180,000	09/01/93- 08/31/96
North Carolina State University Raleigh, NC 27695-7514 Title: Biodegradation and Utilization of Feather Keratin	J. Shih E. Miller	93-37500-9247	\$ 180,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Processing for Value-added Products

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7003 Title: Fourth International Conference on Streptococcal Genetics	T. Klaenhammer	93-37500-9250	\$ 5,507	09/01/93-08/31/94
Cornell University Ithaca, NY 14853 Title: A System Analytical Approach to Modeling Extrusion of Foamed Cereal Products	S. Mulvaney	93-37500-9049	\$ 115,000	09/01/93-08/31/95
Ohio State University Research Foundation Columbus, OH 43210 Title: Continuous Sterilization of Solid-Liquid Mixtures by Ohmic Heating	S. Sastry	93-37500-9255	\$ 160,000	09/01/93-08/31/96
Langston University Langston, OK 73050 Title: National Symposium on Goat Fiber Production, Processing and Marketing	T. Teh	93-37500-8915**	\$ 4,000	08/01/93-01/31/94
Pennsylvania State University University Park, PA 16802-1003 Title: Processing of Materials from Plants and Plant By-Products	S. Komarneni	93-37500-9243	\$ 110,000	09/15/93-09/30/95

** Split Funded Award

National Research Initiative Competitive Grants Program
Processing for Value-added Products

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Structure and Function of Starches from Novel "High-Amylose" Maize Genotypes	D. Thompson I. Harrison C. Boyer	93-37500-9246	\$ 111,000	09/01/93- 08/31/95
Clemson University Clemson, SC 29634-5326 Title: Extending Quality and Shelf Life of Fruits and Vegetables by Edible Coatings	J. Bunn R. Testin P. Vergano H. Park	93-37500-9312	\$ 85,000	09/15/93- 09/30/95
South Dakota State University Brookings, SD 57007 Title: Application of Machine Vision to the Selective Mechanical Harvest of Mushrooms	D. Humburg	93-37500-9244	\$ 110,981	09/01/93 08/31/95
James Madison University Harrisonburg, VA 22807 Title: Production of Polyhydroxyalkanoates from Molasses	D. Dennis	93-37500-9521	\$ 175,000	09/15/93- 09/30/96
Washington State University Pullman, WA 99164-5045 Title: Measurement and Control of Impact Damage Resistance in Fruits and Vegetables	G. Hyde	93-37500-9090	\$ 85,000	09/01/93- 08/31/95

National Research Initiative Competitive Grants Program
Processing for Value-added Products

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Characterization of Enzymes for Debittering Food Protein Hydrolysates	J. Steele K. Parkin	93-37500-9249	\$ 160,000	09/01/93- 08/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Conversion of Plant Proteins to High Value-Added Industrial Polymers	S. Damodaran	93-37500-9242	\$ 60,000	09/15/93- 09/30/94
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Prevention of Rapid Glycolysis Effects on the Quality of Turkey Products	M. Greaser A. Sosnicki	93-37500-9245	\$ 105,000	09/15/93 09/30/95
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Processing of Agro-based Fibers and Wastes as Reinforcements in Thermoplastics	R. Rowell D. Caulfield R. Young A. Sanadi	93-37500-9248	\$ 150,000	09/01/93- 08/31/96
University of Wyoming Laramie, WY 82071 Title: Development of an Alternate Biological Method of Cattle Hide Preservation	B. Ray R. Field	93-37500-9311	\$ 125,000	09/01/93- 08/31/95

Total : \$ 3,677,488

STRENGTHENING AWARDS

Strengthening Awards are intended to ensure that faculty of small and mid-sized institutions or at institutions in USDA-EPSCoR States who have not previously been successful in obtaining competitive grants from the NRICGP or CRGO receive support for strengthening their research programs. The research must be in an area supported by the NRICGP. The following types of Strengthening Awards are available: Research Career Enhancement Awards (to fund sabbatical leaves); Equipment Grants (to supply 50% of the funds necessary to purchase one major piece of equipment within the cost range of \$10,000-\$100,000); Seed Grants (to collect preliminary data); and Strengthening Standard Research Project Grants (to support standard-research projects). Applications for the Research Career Enhancement Awards, Equipment Grants and Seed Grants were reviewed together by multidisciplinary peer panels. Strengthening Standard Research Project applications were reviewed in the program area most appropriate for the type of research proposed. Therefore, these awards also appear under the program area in which they were reviewed.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Alaska Fairbanks, AK 99775 Title: Genetics of Pink Salmon Growth	P. Crandell	93-37206-9120	\$ 100,000	09/15/93-09/30/95
University of Alaska Fairbanks, AK 99775 Title: An Inclusive Regional Economic Model for Rural Alaska	C. Lewis J. Greenberg H. Geier	93-37402-9377	\$ 49,895	09/15/93-09/30/95
Auburn University Auburn University, AL 36849 Title: Gene Transfer in Channel Catfish	R. Dunham	93-37208-9424	\$ 15,125	09/15/93-09/30/94
Auburn University Auburn University, AL 36849 Title: Transformation and Foreign Gene Expression Studies Using the Gene Gun	H. Daniell	93-37311-9455	\$ 10,648	09/15/93-09/30/94
Alabama A&M University Normal, AL 35762 Title: cDNA Cloning and Sequencing of Proteinase Inhibitors in Peanut (<i>Arachis hypogaea</i>)	H. Dodo	93-37311-9515	\$ 50,000	09/15/93-09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Retirement Preparation of Farm Families: Planning for Well-being in Later Life	M. Turner	93-37401-9047	\$ 122,254	09/15/93- 09/30/94
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Oxidative Responses to Insect Herbivory: Implications for Host Plant Suitability	G. Felton	93-37302-9571	\$ 161,048	09/15/93- 09/30/96
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: A Potentially New Group of Enveloped, DNA-Containing Plant Viruses	E. Anderson	93-37311-9514	\$ 49,020	09/15/93 09/30/95
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: The North American Free Trade Agreement: Implications for Rural Employment	M. Killian	93-37401-9046	\$ 126,685	09/01/93- 08/31/96
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Adding Value to Broiler Litter for Increased Consumption by Ruminants	A. Goetsch	93-37500-9152	\$ 163,000	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Addition of GCMS Equipment for Expanding Research Capabilities	T. Lavy	93-37106-9486	\$ 32,283	09/15/93- 09/30/94
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Molecular Simulation of Adsorption at the Clay Mineral/Solution Interface	D. Miller L. Schafer B. Teppen	93-37102-9557	\$ 168,500	09/15/93- 09/30/96
The Board of Trustees University of Arkansas at Pine Bluff Pine Bluff, AR 71601 Title: Alternative Nutrient Sources in Practical Diets for Baitfish and Catfish	R. Lochmann	93-37208-9302	\$ 49,886	09/15/93- 09/30/95
Northern Arizona University Flagstaff, AZ 86011 Title: Water Sources Controls Tree Ecophysiological Processes in Riparian Ecosystems	T. Kolb S. Hart	93-37106-9485	\$ 49,976	09/15/93- 09/30/95
San Diego State University Foundation San Diego, CA 92182 Title: How does Auxin Enhance PM H ⁺ - ATPase Levels?	K. Johnson D. Rayle	93-37311-9458	\$ 50,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Colorado Seminary University of Colorado Denver, CO 80208 Title: Development of High Sensitivity Wideband Acoustic Sensors for Wood	M. Hamstad	93-37103-9106	\$ 120,000	09/15/93- 09/30/95
Colorado Seminary University of Denver Denver, CO 80208 Title: Cloning of P450 Genes Responsible for Alkaloid Resistance in Desert Drosophila	J. Fogleman	93-37311-9446	\$ 50,000	09/15/93- 09/30/95
Wesleyan University Middletown, CT 06457 Title: Regulation of the a2(I) Collagen Gene in Cartilage Cells by Shifting the RNA Start Site	L. Lukens	93-37206-9495**	\$ 169,520	09/15/93 09/30/96
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Quantitative Determination of Inoculum Dispersal Potential	D. Aylor	93-37303-9134	\$ 90,000	09/15/93- 08/31/95
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Intermittent Warming of Tomato Roots	M. Gent	93-37100-9101	\$ 90,000	09/01/93- 08/31/95

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Rates of Uptake and Release of Organic Compounds by Soil Particles	J. Pignatello F. Ferrandino	93-37102-8975	\$ 160,000	09/01/93- 08/31/96
University of Connecticut Storrs, CT 06269-2086 Title: Retinoid Regulation of Gene Expression in Transgenic Mice	M. McGrane	93-37207-9415	\$ 50,000	09/15/93- 09/30/95
University of Connecticut Storrs, CT 06269-2086 Title: Growth Hormone Response to GRF and SRIF in Dairy Sires of Differing Genetic Merit	G. Kazmer S. Zinn	93-37206-9496	\$ 100,000	09/15/93 09/30/95
University of Connecticut Storrs, CT 06269-2086 Title: Phosphoinositide-Specific Phospholipases C from Higher Plants	G. Cote R. Crain	93-37304-9576	\$ 120,000	09/15/93- 09/30/95
University of Connecticut Storrs, CT 06269-2086 Title: Swine Cellular Immunity to an Early and a Late Virul Antigen of Pseudorabies Virus	A. Garmendia	93-37208-9356	\$ 50,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Delaware Newark, DE 19716 Title: Variation in Diabroticite Cucurbitacin Sensitivity	D. Tallamy	93-37302-9026	\$ 165,000	09/01/93- 08/31/96
University of Delaware Newark, DE 19716 Title: Equipment for Avian Research	C. Keeler	93-37208-9421	\$ 50,000	09/15/93- 09/30/94
University of Delaware Newark, DE 19716 Title: Rhizobitoxine Effects on the Soybean Symbiosis Under Field Conditions	J. Fuhrmann B. Vasilas	93-37305-9511	\$ 55,000	09/15/93 09/30/94
University of Delaware Newark, DE 19716 Title: Soybean Severe Stunt Virus cDNA Library Construction and Clone Selection	T. Evans D. Schaff	93-37311-9581	\$ 50,000	09/15/93- 09/30/95
University of South Florida Tampa, FL 33620 Title: Protein Phosphorylation in the Cell Signaling of the Hypersensitive Response of TMV Infected Tobacco	D. Dunigan	93-37303-9135	\$ 60,000	09/01/93- 08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Hawaii, Manoa Honolulu, HI 96822 Title: Genetic Transformation of Grain Legumes for Improved Protein Quality	S. Sun	93-37301-8780	\$ 120,000	08/01/93-07/31/95
University of Hawaii, Manoa Honolulu, HI 96822 Title: Population Dynamics of <i>Nezara viridula</i> and its Parasite <i>Trichopoda pennipes</i>	A. Taylor	93-37311-9459	\$ 47,578	09/15/93-09/30/95
University of Hawaii, Manoa Honolulu, HI 96822 Title: Physiological Responses of Species Having Crassulacean Acid Metabolism to CO2 Enrichment and Temperature	D. Bartholomew G. Goldstein	93-37100-9480	\$ 61,800	09/15/93-09/30/95
University of Idaho Moscow, ID 83843 Title: Biochemistry and Genetics of Sulfonylurea-Insensitive Acetolactate Synthase	C. Eberlein D. Thill D. Hoffman J. Fellman	91-37303-6697++	\$ 50,000	09/15/91-09/30/94
University of Idaho Moscow, ID 83843 Title: Duration and Intensity of Epiaquic Conditions in a Soil Climosequence	P. McDaniel	93-37106-9397	\$ 49,949	09/15/93-09/30/95

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Idaho Moscow, ID 83843 Title: Impact of Log Form Upon Warp in Structural Grades of Softwood Lumber	F. Wagner F. Taylor	93-37103-9395	\$ 58,000	09/15/93- 09/30/95
University of Idaho Moscow, ID 83843 Title: Characterization of a Factor Required for Xanthomonas Pigment and EPS Production	A. Poplawsky W. Chun	93-37311-9516	\$ 49,376	09/15/93- 09/30/95
University of Idaho Moscow, ID 83843 Title: Augmentation of High Liquid Chromatography Equipment	C. Eberlein E. Souza S. Love	93-37311-9454	\$ 7,045	09/15/93- 09/30/94
University of Idaho Moscow, ID 83843 Title: Arsenate Sorption in Flooded Soils	S. McGeehan S. Fendorf	93-37106-9402	\$ 46,991	09/15/93- 09/30/95
University of Idaho Moscow, ID 83843 Title: Identification of Biochemical and Morphological Domains in Grass Leaves	A. Sylvester A. Caplan	93-37311-9451	\$ 49,952	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Idaho Moscow, ID 83843 Title: Fluorescent Activated Cell Sorter: An Instrument to Support Molecular Biology	J. Cloud G. Bohach	93-37208-9423	\$ 50,000	09/15/93- 09/30/94
University of Idaho Moscow, ID 83843 Title: Genetic Analysis of Metabolic Flux in the Yeast <i>Saccharomyces cerevisiae</i>	R. Rosenzweig	93-37311-9450	\$ 50,000	09/15/93- 09/30/95
University of Idaho Moscow, ID 83843 Title: Effects of Oxidative Stress on Photosystem I	S. Herbert	93-37311-9445	\$ 49,452	09/15/93 09/30/95
University of Idaho Moscow, ID 83843 Title: Factors Affecting Acquisitions of Potato Leafroll Virus by the Green Peach Aphid	T. Mowry	93-37311-9460	\$ 42,794	09/15/93- 09/30/95
University of Idaho Moscow, ID 83843 Title: Transposable Element-Mediated Dissection of Protein Structure and Function	C. Weil	93-37301-9358	\$ 113,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Idaho Moscow, ID 83843 Title: Precipitation and Oxidation Reactions of Cr at the Solid Solution Interface	S. Fendorf	93-37102-9481	\$ 145,000	09/15/93- 09/30/96
Western Illinois University Macomb, IL 61455 Title: Light Regulation of Primary Haustorial Formation in Powdery Mildewed Barley	H. Edwards	93-37311-9582	\$ 49,994	09/15/93- 09/30/95
Kansas State University Manhattan, KS 66506 Title: Ultracentrifuge for Molecular Plant Biology Research	P. Chitnis	93-37311-9456	\$ 40,060	09/15/93 09/30/94
Kansas State University Manhattan, KS 66506 Title: Transgenic Technology Applied to Basic Science in Agriculture	D. Grieger M. Justice	93-37208-9422	\$ 16,800	09/15/93- 09/30/94
Murray State University Murray, KY 42071 Title: An Investigation of Compression Creep in Oriented-Strand Board	T. Philpot W. Whitaker	93-37106-9559	\$ 43,120	09/15/93- 09/30/94

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Southwestern Louisiana Lafayette, LA 70504 Title: Reproductive Biology of Red Swamp and White River Crawfishes: Aquacultural Considerations	J. Huner M. Konikoff	93-37208-9500	\$ 49,930	09/15/93- 09/30/95
University of Southwestern Louisiana Lafayette, LA 70504 Title: Endocrine Regulation of Structure and Function in Insect Malpighian Tubules	J. Spring B. Felgenhauer	93-37302-9611	\$ 100,000	09/15/93- 09/30/95
Worcester Polytechnic Institute Worcester, MA 01609 Title: Homeobox Genes as Molecular Markers in <i>Penaeus vannamei</i>	J. Bagshaw	93-37208-9568	\$ 50,000	09/15/93 09/30/95
University of Maryland, Baltimore County Baltimore, MD 21228 Title: Hormonal Control of Gene Expression During Seed Maturation	M. Bustos	93-37304-9439	\$ 100,000	09/15/93- 09/30/95
University of Maryland, Baltimore Baltimore, MD 21201 Title: The Characterization of a Potential Virulence Regulator from <i>Staphylococcus aureus</i>	K. Bayles	93-37207-9567	\$ 50,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maine Orono, ME 04469-5715 Title: Legume Green Manure Effects on Bean/Wild Mustard Interference	M. Liebman	93-37303-8909	\$ 120,000	08/01/93- 07/31/96
University of Maine Orono, ME 04469-5715 Title: The Role of Biological Chelators Produced by fungi in Lignocellulose Degradation	B. Goodell J. Jellison F. Fekete	93-37103-9107	\$ 68,940	09/15/93- 09/30/95
University of Maine Orono, ME 04469-5715 Title: Molecular Biology of Double-Stranded RNA in Rhizoctonia solani	S. Tavantzis	93-37311-9444	\$ 50,000	09/15/93- 09/30/95
St. Cloud State University St. Cloud, MN 56301-4498 Title: Atrial Natriuretic Peptide on Ovarian Progesterone and Estrogen in Micropigs	A. Musah G. Schrank	93-37208-9499	\$ 50,000	09/15/93- 09/30/95
The Curators of the University of Missouri St. Louis, MO 63121 Title: Molecular Genetics of a Second nif Gene Cluster in Anabaena variabilis	T. Thiel	93-37305-9309	\$ 90,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Southern Mississippi Hattiesburg, MS 39406 Title: Lesquerella or Castor Oil??	S. Thames	93-37500-9154	\$ 180,000	09/01/93-08/31/96
University of Southern Mississippi Hattiesburg, MS 39406 Title: Economic Efficiency and Sustainability Arguments for the Subsidization of Aquaculture	T. Green	93-37402-9378	\$ 49,865	09/15/93-09/30/95
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: An Epidemiologic Study of Proliferative Gill Disease in Channel Catfish	L. Pote	93-37204-9117	\$ 98,360	09/15/93-09/30/96
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: Automated Minirhizotron System for Root Observations	F. Whisler	93-37106-9399	\$ 15,652	09/15/93-08/30/94
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: Ontogeny of the Channel Catfish, <i>Ictalurus punctatus</i> , Immune Response	A. Ainsworth	93-37206-9566	\$ 150,000	09/15/93-09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Mississippi State University Mississippi State, MS 39762 Title: Genetic Diversity of Bovine Immunodeficiency Virus in Naturally Infected Cattle	K. St. Cyr-Coats	93-37208-9223	\$ 49,863	09/15/93-09/30/95
MS Forest Products Laboratory Mississippi State University Mississippi State, MS 39762-5724 Title: Factors Affecting the Strength of Fire Retardant-Treated Plywood in Lab and Field Studies	H. Barnes J. Winandy T. Conners	93-37103-9317	\$ 105,000	09/15/93-09/30/97
Montana State University Bozeman, MT 59717 Title: Improving Capabilities for Plant Cold Tolerance Research at Montana State University	P. Bruckner R. Lockerman	93-37106-9487	\$ 24,920	09/15/93-09/30/94
Montana State University Bozeman, MT 59717 Title: Improving Multi-Element Analytical Facilities for Research in Water Quality	W. Inskip J. Wraith J. Bauder	93-37106-9401	\$ 50,000	09/15/93-09/30/94
Montana State University Bozeman, MT 59717 Title: Assessing Weed Management Strategies that Prevent Evolution of Weed Resistance to Herbicides	B. Maxwell W. Dyer P. Fay	93-37303-9433	\$ 57,339	09/15/93-09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Montana State University Bozeman, MT 59717	M. White M. Jutila B. Granger M. Abrahamsen	93-37208-9501	\$ 15,250	09/15/93- 09/30/94
Title: Equipment Grant; Centrifugal Elutriation				
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105	M. Biondini C. Grygiel	93-37101-8996	\$ 135,000	09/15/93- 09/30/96
Title: Grassland Patchiness and the Scaling of Soil Nitrogen				
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105	A. Grazul-Bilska	93-37208-9224	\$ 50,000	09/01/93 08/31/95
Title: Regulation of Intercellular Communication of Bovine Luteal Cells				
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105	D. Redmer	93-37208-9278	\$ 61,968	09/01/93- 08/31/95
Title: Isolation of Luteal Angiogenic Factors				
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105	D. Redmer L. Reynolds	93-37203-9271	\$ 200,000	09/01/93- 08/31/96
Title: Role of Angiogenic Factors in Ovarian Function				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Mass Spectral Analysis of Multiple Trichothecenes in Foods	H. Casper	93-37207-9417	\$ 49,863	09/15/93-09/30/94
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: UPD-Glucose Pyrophosphorylase Regulation of Potato Carbohydrate Metabolism	P. McClean	93-37304-9284	\$ 100,000	09/15/93-09/30/95
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Purification and Characterization of Xyloglucan Xylosyl Transferase	A. White	93-37304-9441	\$ 100,000	09/15/93-09/30/95
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Molecular Mapping of Tan Spot Resistance Genes in Wheat	J. Anderson L. Francl	93-37311-9388	\$ 50,000	09/15/93-09/30/95
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Export Credit in International Wheat Trade	D. Johnson W. Wilson C. Gustafson	93-37400-9464	\$ 100,000	09/15/93-09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Interaction of the Pyrenophora tritici-repentis Necrosis Toxin with Wheat	S. Meinhardt	93-37311-9389	\$ 49,561	09/15/93-09/30/95
University of North Dakota, School of Medicine Grand Forks, ND 58202 Title: Glutathione Metabolism and Fumonisin Cytotoxicity	Y. Kang	93-37208-9277	\$ 50,000	09/01/93-08/31/95
University of North Dakota, School of Medicine Grand Forks, ND 58202 Title: Oxidative Modification of Membrane-Associated Proteins: A Model System	K. Sukalski	93-37207-9418	\$ 50,000	09/15/93-09/30/95
University of New Hampshire Durham, NH 03824 Title: Carbon Controls on Nitrogen Retention by Temperate Forest Ecosystems	W. McDowell J. Aber R. Boone	93-37101-8700	\$ 292,000	08/01/93-07/31/96
University of New Hampshire Durham, NH 03824 Title: Infrastructure Investment and Rural Economic Development	J. Halstead	93-37401-8971	\$ 126,618	09/01/93-08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of New Hampshire Durham, NH 03824 Title: Riparian Influences on Water Quality from Natural and Afforested Grasslands	W. Bowden	93-37106-9398	\$ 78,841	09/15/93- 09/30/94
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Use of RAPD Markers to Determine the Genetic Diversity of Gossypium Germplasm Derived from Interspecific Hybridization	R. Cantrell	93-37311-9447	\$ 49,013	09/15/93- 09/30/95
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Isolation of Genes Coding for Plant Polyamine Biosynthetic Enzymes	G. Phillips G. Kuehn S. Bagga	93-37301-9429	\$ 110,000	09/15/93 09/30/95
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Denitrification as a Means to Remediate Groundwater Contaminated with Dairy Waste	Z. Samani	93-37106-9621	\$ 50,000	09/15/93- 09/30/95
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Lysophosphatidic Acid Acyltransferase: Enzyme and Gene Isolation from Soybean	R. Rajasekharan J. Kemp	93-37304-9434	\$ 100,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Localization of Transcripts at a Cellular Level - Set up for in situ Hybridization	C. Sengupta-Gopalan	93-37311-9457	\$ 30,000	09/15/93- 09/30/94
Board of Regents University of Nevada System Reno, NV 89557 Title: HPAE-PAD System for the Identification and Measurement of Plant Carbohydrates	B. Moore J. Seemann	93-37311-9390	\$ 20,052	09/15/93- 09/30/94
Research Foundation of State University of New York Albany, NY 12201 Title: Cytological Aspects of Wood Decay and Preservation	R. Hanna S. Anagnost	93-37103-9183	\$ 84,000	09/01/93 08/31/95
Rensselaer Polytechnic Institute Troy, NY 12180-3590 Title: Patterns of Developmental Events in Floral Initiation	C. McDaniel	93-37304-9440	\$ 80,000	09/15/93- 09/30/95
University of Central Oklahoma Edmond, OK 73034 Title: Use of Chickpea and Pigeon Pea in Wheat - Legume Cropping Systems	J. Bidlack	93-37311-9580	\$ 48,990	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Langston University Langston, OK 73050 Title: National Symposium on Goat Fiber Production, Processing and Marketing	T. Teh	93-37500-8915**	\$ 7,500	08/01/93- 01/31/94
Oklahoma State University Stillwater, OK 74078 Title: Multi-User Automated Peptide Synthesizer	J. Cushman	93-37208-9420	\$ 43,750	09/15/93- 09/30/94
University of Tulsa Tulsa, OK 74104-3189 Title: Comparative Ecology of Within Flower Patch Foraging in Apis Species	H. Wells	93-37311-9488**	\$ 48,911	09/15/93- 09/30/95
Lehigh University Bethlehem, PA 18015 Title: Nuclear Gene Products and Chloroplast Gene Expression	M. Kuchka	93-37301-9428	\$ 95,000	09/15/93- 09/30/95
Millersville University of Pennsylvania Millersville, PA 17551-0320 Title: Managing Mycorrhizal Fungi for Increased Crop Yields and Nutrient Retention	D. Yocom	93-37311-9615	\$ 49,875	09/15/93- 09/30/95

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Duquesne University Pittsburgh, PA 15282 Title: Molecular Analysis of Polypeptide Growth Factors in <i>Tribolium castaneum</i>	J. Doctor	93-37311-9449	\$ 49,971	09/15/93- 09/30/95
Duquesne University Pittsburgh, PA 15282 Title: Nematode Origins and Evolutionary Relationships	J. Garey	93-37311-9448	\$ 49,998	09/15/93- 09/30/95
West Chester University West Chester, PA 19383 Title: Impacts of Timber Harvesting Methods on Lizards of the Florida Sand Pine Scrub	H. Tiebout R. Anderson	93-37106-9600	\$ 49,960	09/15/93 09/30/95
University of Rhode Island Kingston, RI 02881 Title: Immunomicrobial Biosensors for Detection of <i>Salmonella</i> in Foods	A. Rand S. Letcher C. Brown	93-37201-9197	\$ 179,942	09/01/93- 08/31/95
University of Rhode Island Kingston, RI 02881 Title: Immunological Assessment of Hybrid Striped Bass at Three Culture Temperatures	R. Carlson R. Wolke	93-37208-9280	\$ 50,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Rhode Island Kingston, RI 02881 Title: Mucus Regulated Genes and Proteins of <i>Vibrio anguillarum</i>	D. Nelson	93-37207-9416	\$ 49,976	09/15/93- 09/30/95
University of Rhode Island Kingston, RI 02881 Title: Equipment Request to Support the Application of P.C.R. Technology for Plant Biology Research	J. Chandlee	93-37311-9453	\$ 5,400	09/15/93- 09/30/94
Medical University of South Carolina Charleston, SC 29425 Title: Vaccination Against Cryptocaryon	E. James	93-37208-9419	\$ 50,000	09/15/93 09/30/95
Medical University of South Carolina Charleston, SC 29425 Title: Excretion of Xenobiotics in Bony and Elasmobranch Fishes	K. Karnaky	93-37208-9498	\$ 50,000	09/15/93- 09/30/95
Medical University of South Carolina Charleston, SC 29425 Title: Purchase of a High-Throughput DNA/RNA Synthesizer	G. Warr	93-37208-9497	\$ 22,009	09/15/93- 09/30/94

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Clemson University Clemson, SC 29634-5326	W. Baird A. Abbott R. Ballard W. Bridges	93-37300-8818	\$ 200,000	08/01/93- 07/30/96
Title: Chromosome Mapping in Peach and its Application to Fruit Quality Maintenance				
Clemson University Clemson, SC 29634-5326	M. Riley	93-37106-9328	\$ 26,280	09/15/93- 09/30/94
Title: HPLC Addition for Multi-User Analytical Laboratory				
Clemson University Clemson, SC 29634-5326	G. Powell A. Abbott	93-37301-9426	\$ 112,000	09/15/93 09/30/95
Title: Characterization of the 12-Desaturase				
University of South Carolina Columbia, SC 29208	T. Mousseau	93-37302-9307	\$ 71,012	09/01/93- 08/31/95
Title: Preference/Performance Relationships in a Leaf-Mining Beetle				
University of South Carolina Columbia, SC 29208	L. Marton	93-37305-9442	\$ 90,000	09/15/93- 09/30/95
Title: Homologous Recombination Approach for the Molecular Biology of Arabidopsis NR Genes				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
South Dakota State University Brookings, SD 57007 Title: Application of Machine Vision to the Selective Mechanical Harvest of Mushrooms	D. Humburg	93-37500-9244	\$ 110,981	09/01/93-08/31/95
South Dakota State University Brookings, SD 57007 Title: Heterogeneity in Growth Factor Response of Myogenic Satellite Cell Populations	D. McFarland	93-37208-9276	\$ 50,000	09/15/93-09/30/95
South Dakota State University Brookings, SD 57007 Title: Alternative Processing Technology for Soy Protein Products	C. Wang	93-37501-9286	\$ 50,000	09/15/93-09/30/95
South Dakota State University Brookings, SD 57007 Title: Consequences of Interaction of Bovine Herpesviruses with Mononuclear Leukocytes	C. Chase D. Hurley	93-37208-9281	\$ 50,000	09/15/93-09/30/95
South Dakota State University Brookings, SD 57007 Title: Strategy to Identify Genes Linked Directly to Freeze Resistance	F. Sutton	93-37106-9381	\$ 50,000	09/15/93-09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
South Dakota State University Brookings, SD 57007 Title: Developmental Regulation of Soybean Fatty Acid Synthesis	T. Cheesbrough	93-37311-9452	\$ 50,000	09/15/93-09/30/95
Augustana College Sioux Falls, SD 57197-0001 Title: Land Use, SOM Changes, and C Budgets: Satellite Projections of Isotopic Data	L. Tieszen	93-37106-9400	\$ 68,472	09/15/93-09/30/95
University of South Dakota Vermillion, SD 57069-2390 Title: The Role of Vitrified Sugars in Plant Desiccation Tolerance	K. Koster	93-37100-8993	\$ 100,000	09/01/93-08/31/95
Texas Tech University Lubbock, TX 79409-1035 Title: Purchase and Use of a Portable Photosynthesis System for Plant Stress Research	A. Holaday R. Allen	93-37311-9513	\$ 8,538	09/15/93-09/30/94
Trinity University San Antonio, TX 78212 Title: Protein Structure/Function Studies of Phytochrome/Auxin Interactions in Dicots	J. Shinkle	93-37311-9590	\$ 59,930	09/15/93-09/30/94

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
James Madison University Harrisonburg, VA 22807 Title: Production of Polyhydroxyalkanoates from Molasses	D. Dennis	93-37500-9521	\$ 175,000	09/15/93- 09/30/96
University of Vermont and State Agricultural College Burlington, VT 05405 Title: The Effect of Parental Smoking on the Quality of Low-Income Children's Diets	R. Johnson	93-37200-8758	\$ 41,081	08/01/93- 07/31/94
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Nutrient Mediated Susceptibility of Red Spruce to Winter Injury	T. Perkins	93-37100-8994	\$ 120,000	09/01/93 08/31/96
University of Vermont and State Agricultural College Burlington, VT 05405 Title: What Determines the pH in Acid Forest Soil Surface Horizons	D. Ross R. Bartlett F. Magdoff	93-37101-8997	\$ 80,000	09/15/93- 09/30/95
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Improved Detection of Sublethally Injured Listeria in Foods	C. Donnelly	93-37201-9191	\$ 150,234	09/01/93- 08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Vermont and State Agricultural College Burlington, VT 05405	A. Bramley I. Politis B. Zavizion	93-37204-9216	\$ 100,000	09/01/93- 08/31/95
Title: Interactions Between Bovine Epithelial Cells and Mastitis Pathogens				
University of Vermont and State Agricultural College Burlington, VT 05405	K. Plaut	93-37208-9279	\$ 49,997	09/01/93- 08/31/95
Title: Development of Whole Organ Culture for Bovine Mammary Tissue				
University of Vermont and State Agricultural College Burlington, VT 05405	D. Ross W. Jokela D. Wang J. Hughes	93-37106-9327	\$ 20,188	09/15/93- 09/30/94
Title: Acquisition of an Automated Ion Analyzer				
Lyndon State College Lyndonville, VT 05851	R. Zwick R. Muth	93-37402-9519	\$ 49,770	09/15/93- 09/30/95
Title: Rural Values, Rural Myths and the Meaning of Rurality in Vermont and Massachusetts				
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506	A. Shiemke	93-37102-8999	\$ 177,000	09/01/93- 08/31/96
Title: Isolation and Characterization of Membrane-Bound Methane Monooxygenase				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Cell-Specific Regulation of the Nuclear T3 Receptor	F. Hillgartner	93-37206-9219	\$ 250,000	09/01/93-08/31/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Genetic Organization and Regulation in Leptospira interrogans	D. Yelton	93-37204-9209	\$ 100,000	09/01/93-08/31/95
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Strengthening Environmental Change Research at West Virginia University	W. Peterjohn	93-37106-9329	\$ 19,900	09/15/93-09/30/94
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Monitoring Forest Response to Canopy Gaps Created by Partial Harvesting	M. Fajvan	93-37106-9380	\$ 48,502	09/15/93-09/30/95
University of Wyoming Laramie, WY 82071 Title: Factors Related to Urinary Oxalate Excretion in Man	M. Liebman	93-37200-9403	\$ 150,000	09/15/93-09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Strengthening Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Wyoming Laramie, WY 82071 Title: Development of an Alternate Biological Method of Cattle Hide Preservation	B. Ray R. Field	93-37500-9311	\$ 125,000	09/01/93-08/31/95
University of Wyoming Laramie, WY 82071 Title: Evaluation of the Photodegradation of U.S. Wools	B. Cameron D. Brown	93-37501-9522	\$ 49,742	09/15/93-09/30/95
University of Wyoming Laramie, WY 82071 Title: Identifying Compatible Russian Wheat Aphid Management Strategies Utilizing Barley Plant Resistance and Natural Control	M. Brewer	93-37311-9512	\$ 44,687	09/15/93-09/30/95

Total : \$ 10,960,382

**DOE/NSF/USDA JOINT PROGRAM ON COLLABORATIVE
RESEARCH IN PLANT BIOLOGY**

The DOE/NSF/USDA Joint Program on Collaborative Research in Plant Biology was initiated in FY 1992 in recognition of the importance of plant biology research to the well-being of the Nation. The Program goals are to strengthen the foundation of plant science by fostering multidisciplinary research through excellence in training and by encouraging research coordination and communication among plant scientists. The projects listed were reviewed in FY 1992 and awarded as continuation awards. Funds are allotted each year for the duration of the award. Please note that the agreement period indicates the total length of the award. However, the funds shown are for the current fiscal year only.

National Research Initiative Competitive Grants Program
Triagency - Plant Systems

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Research Collaboration Group on Molecular Mapping in Wheat and Its Relatives	C. Qualset	92-37310-7664++	\$ 115,155	09/01/92- 08/31/94
University of Nebraska Lincoln, NE 68588-0430 Title: Genetic Basis for Pathogenicity in the Genus Colletotrichum	M. Dickman	92-37310-7821++	\$ 50,000	09/01/92- 08/31/94

Total : \$ 165,155

++ Continuation Award

National Research Initiative Competitive Grants Program
 Triagency - Natural Resources & Environment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: The Bodega Field Conferences	J. Clegg B. Bentley	92-37105-7674++	\$ 50,000	09/01/92- 08/31/94
The Curators of the University of Missouri Columbia, MO 65211 Title: Research Collaboration Group in Plant Protein Phosphorylation	D. Randall	92-37105-7675++	\$ 50,000	09/01/92- 08/31/94
University of Washington Seattle, WA 98195 Title: Molecular Genetics of Populus: Collaborative Network	R. Stettler P. Heilman H. McNabb	92-37105-7764++	\$ 114,000	09/01/92- 08/31/94
Total :			\$ 214,000	

++ Continuation Award

CROSS-DIVISIONAL OR CROSS-PROGRAMMATIC TOPIC

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FORESTRY-RELATED RESEARCH

Research which has as its major goal the study of forest and forest-related topics is supported in several Program Areas within the Division of Natural Resources and the Environment and within the Division of Plant Systems. Awards so identified are listed separately here; they also appear in the listing for the supporting Program Area.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Northern Arizona University Flagstaff, AZ 86011 Title: Water Sources Controls Tree Ecophysiological Processes in Riparian Ecosystems	T. Kolb S. Hart	93-37106-9485	\$ 49,976	09/15/93- 09/30/95
The Regents of the University of California Berkeley, CA 94720 Title: New Symbiotic Associations Among a Pine-Pathogenic Fungus and its Insect Vectors	D. Wood T. Gordon	93-37302-9594	\$ 180,000	09/15/93- 09/30/96
PSWFRES USDA, Forest Service Berkeley, CA 94701 Title: Codominant PCR-based Markers for Pines and Other Conifers	D. Harry D. Neale	93-37300-8785	\$ 200,000	08/01/93 07/31/96
PSWFRES USDA, Forest Service Berkeley, CA 94701 Title: Molecular Marker and Quantitative Trait Mapping in Douglas-Fir	D. Neale N. Wheeler	93-37300-8759	\$ 223,000	09/01/93- 08/31/96
The Regents of the University of California Berkeley, CA 94720 Title: Genetic Structure of Heterobasidion annosum in White Fir (Abies concolor) Root Decay Centers	T. Bruns F. Cobb	93-37101-8701	\$ 175,000	08/01/93- 07/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Regeneration of Pinyon-Juniper Woodland and Nitrogen Fixation by <i>Purshia tridentata</i>	A. Berry	93-37101-8863	\$ 56,000	08/15/93- 08/31/95
Colorado State University Fort Collins, CO 80523 Title: Controls on the Allocation of Production in Coniferous Forest Ecosystems	F. Smith J. Long A. Schoettle	93-37101-9015	\$ 175,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Absorbing Surface Area of Southern Pine Root Systems: Nutrient and Water Uptake Function	N. Comerford S. Torreano	93-37100-8869	\$ 120,000	09/15/93 09/30/95
University of Florida Gainesville, FL 32611 Title: Impacts of Clearcutting on Important Animal Populations in Cypress Ponds	K. Ewel	93-37101-9102	\$ 175,000	09/15/93- 12/31/96
USDA/ARS South Atlantic Area Athens, GA 30613 Title: Effects of Management and Ecosystem Type on Nutrient Retention in Riparian Zones	R. Lowrance M. Beare J. Meyer	93-37102-8955	\$ 298,000	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011	E. Takle R. Schmidt J. Brandle	93-37101-8954	\$ 295,016	08/01/93- 07/31/96
Title: Microclimate Impacts of Shelterbelts on Agroforestry Ecosystems				
USDA/ARS Mid-West Area Peoria, IL 61604	J. Ralph	93-37103-9155	\$ 110,000	09/01/93- 08/31/95
Title: Development of a Selective Method for Quantitation and Localization of Alpha-ethers in Lignins				
Purdue Research Foundation West Lafayette, IN 47907	R. Swihart	93-37101-8702	\$ 120,000	08/01/93 07/31/96
Title: Effect of Forest Fragmentation on Mammals in an Agricultural Landscape				
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803	G. Lang T. Chen R. Darnel A. Khan	93-37304-9372**	\$ 7,000	09/15/93- 09/30/94
Title: 1st International Symposium of Plant Dormancy				
Southern Forest Expt. Station USDA Forest Service New Orleans, LA 70113	W. Smith	93-37101-8662	\$ 315,000	09/01/93- 08/31/96
Title: Herbivory and Plant Interactions in Bottomland Hardwood Experimental Gaps				

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
President and Fellows of Harvard University Cambridge, MA 02138 Title: Latitudinal Variation in Birch Responses to Elevated CO2 and Climate Change	P. Wayne	93-37100-9012	\$ 87,160	09/15/93- 09/30/95
Individual Awardee Belleville, MI 48111 Title: Dynamics of Plant Sensitivity, Defoliation, CO2, and Ozone on Insect Performance	J. Stoyenoff	93-37302-9178	\$ 69,607	09/15/93- 09/30/95
Herbert H. & Grace A. Dow Foundation Midland, MI 48640 Title: Effects of Tree Life History, Abiotic Stress, and Defoliation on Tree Resistance to Folivores	D. Herms J. Nitao M. Nair W. Mattson	93-37302-9506	\$ 180,000	09/15/93- 09/30/96
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Differential Gene Expression for Anthocyanin in Juvenile and Mature Ivy	W. Hackett A. Smith	93-37304-9369	\$ 100,000	09/15/93- 09/30/95
Duke University Durham, NC 27708 Title: Response of Western Montane Forest Ecosystems to Global Climate Change	W. Schlesinger	91-37101-6724++	\$ 127,000	09/01/91- 08/31/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7003	B. Liu D. O'Malley F. Bridgewater D. Grattapaglia	93-37300-8839	\$ 100,000	09/01/93- 08/31/95
Title: Genome Map Assisted Plant Breeding (GMAPB) for Forest Tree				
North Carolina State University Raleigh, NC 27695-7003	R. Sederoff M. Tierney R. Whetten	93-37103-9184	\$ 155,000	09/15/93- 03/31/96
Title: Extension-like Protein in the Wood Cell Wall				
University of New Hampshire Durham, NH 03824	W. McDowell J. Aber R. Boone	93-37101-8700	\$ 292,000	08/01/93- 07/31/96
Title: Carbon Controls on Nitrogen Retention by Temperate Forest Ecosystems				
Rutgers, The State University Piscataway, NJ 08855-1089	B. Hillman	91-37303-6651++	\$ 50,000	09/01/91- 08/31/94
Title: Structure and Function of Viral dsRNAs of the Chestnut Blight Fungus				
Board of Regents University of Nevada System Reno, NV 89557	S. Seybold	93-37302-8926	\$ 90,000	08/01/93- 07/31/95
Title: Enantioselective Biosynthesis of Pine Bark Beetle (<i>Ips</i> spp.) Pheromone Compounds				

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Recent Changes in Nutrient Concentrations in the Northern Hardwood Forest	R. Yanai M. Arthur	93-37101-8582	\$ 228,273	05/15/93- 05/31/96
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Ozone-induced Changes in Seasonal Growth and Carbon Allocation in Sugar Maple	M. Topa	93-37100-8914	\$ 231,600	09/01/93- 08/31/96
Cornell University Ithaca, NY 14853 Title: Response of Pin Cherry-Northern Hardwood Stands to Changes in Resource Availability	T. Fahey	92-37101-7438++	\$ 92,000	07/01/92 06/30/95
The New York Botanical Garden Millbrook, NY 12545 Title: Carbohydrate Economy in Relation to Ecological Patterns of Tree Regeneration	C. Canham R. Chazdon	93-37100-8873	\$ 100,000	09/01/93- 08/31/95
Research Foundation of State University of New York Albany, NY 12201 Title: Virus Infection of Red Spruce: Mechanisms of Spread and Relationship to Decline	J. Castello M. Schaedle S. Rogers	93-37101-8837	\$ 210,000	09/01/93- 08/31/96

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agricultural Expt. Station Oklahoma State University Stillwater, OK 74078 Title: The Effect of Regeneration Methods on Genetic Diversity in Shortleaf Pine	R. Wittwer C. Tauer	93-37100-9013	\$ 90,008	09/01/93- 08/31/96
Oregon State University Corvallis, OR 97331 Title: Workshop on Stems and Trunks in Plant Form and Function	B. Gartner	93-37100-9063**	\$ 10,020	09/01/93- 06/30/94
Oregon State University Corvallis, OR 97331 Title: Floral Homeotic Genes for Genetic Engineering of Sterility in Populus	S. Strauss W. Rottmann	93-37301-9425	\$ 120,000	09/15/93 09/30/95
Oregon State University Corvallis, OR 97331 Title: Oxidatively Coupled Polyphenols of Douglas-fir Bark: Molecular Structures and Reactions for Utilization	J. Karchesy	93-37103-9483	\$ 90,000	09/15/93- 09/30/95
Pennsylvania State University University Park, PA 16802-1003 Title: Pathogen Tolerance in Lymantria dispar: Genetic and Maternal Effects Components	J. Frazier	91-37302-6292++	\$ 70,000	08/01/91- 07/31/94

** Split Funded Award ++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Purification of the Cry1A Bacillus Thuringiensis Toxin Binding Protein(s) from Gypsy Moth	W. McCarthy	93-37302-9132	\$ 110,000	09/01/93-08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Dendrochemical Detection of Soil Chemistry Trends Associated with Global Change	D. DeWalle W. Sharpe P. Edwards	93-37100-9164	\$ 100,000	09/01/93-08/31/95
West Chester University West Chester, PA 19383 Title: Impacts of Timber Harvesting Methods on Lizards of the Florida Sand Pine Scrub	H. Tiebout R. Anderson	93-37106-9600	\$ 49,960	09/15/93-09/30/95
University of South Carolina Columbia, SC 29208 Title: Preference/Performance Relationships in a Leaf-Mining Beetle	T. Mousseau	93-37302-9307	\$ 71,012	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Conifer Transformation with Shoot Apices and Agrobacterium	R. Newton	93-37300-8859	\$ 153,000	09/01/93-08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: International Conference on Population Dynamics, Behavior, and Control of Forest Insects	S. Salom F. Ravlin	93-37302-9133	\$ 2,000	09/01/93- 08/31/94
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Fundamental Aspects of Lignin-Carbohydrate Covalent Interactions	R. Helm	93-37103-9324	\$ 80,000	09/15/93- 09/30/95
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Nutrient Mediated Susceptibility of Red Spruce to Winter Injury	T. Perkins	93-37100-8994	\$ 120,000	09/01/93 08/31/96
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Acquisition of an Automated Ion Analyzer	D. Ross W. Jokela D. Wang J. Hughes	93-37106-9327	\$ 20,188	09/15/93- 09/30/94
Washington State University Pullman, WA 99164-5045 Title: Defense Reactions in Conifers: Oleoresinosis	R. Croteau	91-37302-6311	\$ 70,000	08/01/91- 07/31/94

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Forestry Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Washington Seattle, WA 98195 Title: Molecular Genetics of Populus: Collaborative Network	R. Stettler P. Heilman H. McNabb	92-37105-7764++	\$ 114,000	09/01/92- 08/31/94
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Tree Response to Elevated CO2 and Herbivory: Growth, Physiology and Insect Performance	E. Kruger R. Lindroth J. Volin	93-37100-8856	\$ 190,000	08/01/93- 07/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Effects of Alternative Landscape Management on Forest Tree Regeneration	D. Waller	93-37101-8661	\$ 200,000	07/01/93 06/30/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Strengthening Environmental Change Research at West Virginia University	W. Peterjohn	93-37106-9329	\$ 19,900	09/15/93- 09/30/94
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Monitoring Forest Response to Canopy Gaps Created by Partial Harvesting	M. Fajvan	93-37106-9380	\$ 48,502	09/15/93- 09/30/95

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Total : \$ 6,340,222

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CROSS-DIVISIONAL OR CROSS-PROGRAMMATIC TOPIC

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GLOBAL CHANGE RESEARCH

Research which has as its major goal the study of topics related to climate change is a part of the USDA commitment to the U.S. Global Change Research Program. This research is supported in several Program Areas within the Division of Natural Resources and the Environment and within the Division of Plant Systems. Awards so identified are listed separately here; they also appear in the listing for the supporting Program Area.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Molecular and Cellular Mechanisms of Stress Tolerance in Plants -- 1993 NATO Workshop	J. Cherry	93-37100-8596	\$ 3,000	05/15/93- 11/30/93
Arizona State University Tempe, AZ 85287-1903 Title: Specific Mutagenesis of the Photosystem I Reaction Center in Chloroplasts	A. Webber S. Bingham	91-37306-6473	\$ 110,000	08/15/91- 08/31/95
University of Arizona Tucson, AZ 85721 Title: Polyol Synthesis and Stress Resistance in Transgenic Plants	R. Jensen	93-37100-8868	\$ 180,000	08/01/93 07/31/96
University of Arizona Tucson, AZ 85721 Title: Genetic Dissection of Carotenogenesis in Higher Plants: Phytoene Desaturation	D. Penna	93-37306-9083	\$ 100,000	09/15/93- 09/30/95
University of Arizona Tucson, AZ 85721 Title: Role of Class I Small HSPs in Plant Development and Thermotolerance	E. Vierling	93-37100-9061	\$ 190,000	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Arizona Tucson, AZ 85721 Title: Transcription and RNA Stability During Plant Stress	H. Bohnert	93-37304-9367	\$ 110,000	09/15/93- 09/30/95
The Regents of the University of California Berkeley, CA 94720 Title: The Role of Galactose Oligosaccharides (GO) in Seed Desiccation Tolerance	B. de Lumen	93-37100-8905	\$ 100,000	09/01/93- 08/31/95
The Regents of the University of California Davis, CA 95616-8671 Title: Molecular Characterization of the Early-Salt-Stress Response in the Salt-Tolerant <i>Lophopyrum Elongatum</i>	J. Dvorak	93-37100-9288	\$ 90,000	09/15/93 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: The Bodega Field Conferences	J. Clegg B. Bentley	92-37105-7674++	\$ 50,000	09/01/92- 08/31/94
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: The Reaction Center of PSII: Isolation, Characterization and Crystallography	M. Okamura N. Adir	93-37306-9579	\$ 110,000	09/15/93- 09/30/95

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Los Angeles, CA 90024-1406 Title: Steps in the In vivo Synthesis of Plastocyanin	S. Merchant	91-37306-6348++	\$ 55,000	08/01/91- 07/31/94
The Regents of the University of California Los Angeles, CA 90024-1406 Title: Stomatal Control in Agricultural Crops	E. Zeiger	91-37100-6613	\$ 100,000	09/01/91- 08/31/95
The Regents of the University of California Los Angeles, CA 90024-1406 Title: The Light-harvesting Complexes of Photosystems I and II	J. Thornber	93-37306-9577	\$ 110,000	09/15/93 09/30/95
The Regents of the University of California Riverside, CA 92521 Title: Heat Shock Response in Higher Plants	D. Gallie	93-37100-8939	\$ 100,000	09/01/93- 08/31/95
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Intermittent Warming of Tomato Roots	M. Gent	93-37100-9101	\$ 90,000	09/01/93- 08/31/95

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Delaware Newark, DE 19716 Title: Rate Limitations for Photosynthesis in Intact Leaves	J. Boyer	93-37306-9578	\$ 110,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Structure and Function of CAPs 160 and 85	C. Guy	93-37100-8906	\$ 190,000	09/01/93- 08/31/96
University of Florida Gainesville, FL 32611 Title: Regulation of the Primary Carboxylases in Aquatic Plants	G. Bowes	93-37306-9386	\$ 65,000	09/15/93 09/30/94
University of Hawaii, Manoa Honolulu, HI 96822 Title: Mechanism and Regulation of Xanthophyll-Dependent Protection of PSII Photochemistry	H. Yamamoto	93-37100-9062	\$ 210,000	09/01/93- 08/31/96
University of Hawaii, Manoa Honolulu, HI 96822 Title: Physiological Responses of Species Having Crassulacean Acid Metabolism to CO2 Enrichment and Temperature	D. Bartholomew G. Goldstein	93-37100-9480	\$ 61,800	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Molecular Biochemistry of Herbicide Resistance	C. Wright	92-37306-7692++	\$ 50,000	09/01/92- 08/31/94
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Effects of Increased UV Radiation on Plant-pollinator Interactions	J. Conner G. Robinson	93-37302-9028	\$ 180,000	09/15/93- 09/30/96
Purdue Research Foundation West Lafayette, IN 47907 Title: Identification of Traits Which Impart Freezing Tolerance in Arabidopsis thaliana	E. Ashworth	93-37100-8838	\$ 90,000	08/01/93 07/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Salt and Drought Tolerance of F8 Maize Lines Differing for Glycinebetaine	D. Rhodes R. Joly P. Goldsbrough	93-37100-8870	\$ 120,000	08/15/93- 08/31/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Characterization of the Gene and Enzyme of the First Step of Proline Synthesis	L. Csonka R. Bressan	93-37100-8871	\$ 190,000	09/01/93- 08/31/96

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Purdue Research Foundation West Lafayette, IN 47907 Title: Regulation of Photosynthesis, N ₂ -Fixation and Granule Formation in Cyanobacteria	L. Sherman	93-37306-9238	\$ 103,000	09/15/93-09/30/95
Purdue Research Foundation West Lafayette, IN 47907 Title: Determination of the Crystal Structures of Cytochrome f and the Rieske Protein	J. Smith W. Cramer	91-37306-6317	\$ 103,000	09/01/91-08/31/95
Kansas State University Manhattan, KS 66506 Title: Topology and Assembly of the Photosystem 1 Reaction Center Core	J. Guikema	93-37306-9147	\$ 110,000	09/15/93-09/30/95
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803 Title: 1st International Symposium of Plant Dormancy	G. Lang T. Chen R. Darnel A. Khan	93-37304-9372**	\$ 7,000	09/15/93-09/30/94
Board of Supervisors Louisiana State University & A&M College Baton Rouge, LA 70803-3805 Title: Domains on CPa-1 Which Interact with Component Required for Oxygen Evolution	T. Bricker	91-37306-6350	\$ 110,000	09/01/91-08/31/95

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Massachusetts General Hospital Boston, MA 02114 Title: Molecular Mechanisms of Maize C4PPDK Gene Regulation	J. Sheen	91-37306-6352++	\$ 55,000	09/01/91-08/31/94
President and Fellows of Harvard University Cambridge, MA 02138 Title: Latitudinal Variation in Birch Responses to Elevated CO2 and Climate Change	P. Wayne	93-37100-9012	\$ 87,160	09/15/93-09/30/95
Massachusetts Institute of Technology Cambridge, MA 02139 Title: Stomatal Signal Transduction: Physiology, Arabidopsis Mutants, and Biochemistry	E. Kearns	93-37100-9556	\$ 81,640	09/15/93-09/30/95
Individual Awardee Belleville, MI 48111 Title: Dynamics of Plant Sensitivity, Defoliation, CO2, and Ozone on Insect Performance	J. Stoyenoff	93-37302-9178	\$ 69,607	09/15/93-09/30/95
University of Maryland College Park, MD 20742 Title: Zeaxanthin-mediated Photoprotection in Oxygenic Photosynthetic Organisms	E. Gantt F. Cunningham	93-37100-9011	\$ 120,000	09/15/93-09/30/95

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maine Orono, ME 04469-5715 Title: A Factor Mediating Translational Activity During Environmental Stress	M. Vayda	91-37100-6622	\$ 150,000	09/01/91- 08/31/95
Michigan State University East Lansing, MI 48824 Title: Salinity Tolerance and Regulation of Mannitol Metabolism	W. Loescher R. Grumet J. Everard	93-37100-8907	\$ 60,000	08/01/93- 07/31/94
Michigan State University East Lansing, MI 48824 Title: Charge Separation and Stabilization in Chloroplast Photosystem II	G. Babcock	92-37306-7694++	\$ 50,000	09/01/92 08/31/94
Michigan State University East Lansing, MI 48824 Title: Nitrous Oxide and Methane Fluxes in Agricultural Ecosystems	G. Robertson	93-37101-9016	\$ 125,000	09/01/93- 08/31/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Research Collaboration Group in Plant Protein Phosphorylation	D. Randall	92-37105-7675++	\$ 50,000	09/01/92- 08/31/94

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Montana State University Bozeman, MT 59717 Title: Improving Capabilities for Plant Cold Tolerance Research at Montana State University	P. Bruckner R. Lockerman	93-37106-9487	\$ 24,920	09/15/93- 09/30/94
Duke University Durham, NC 27708 Title: Response of Western Montane Forest Ecosystems to Global Climate Change	W. Schlesinger	91-37101-6724++	\$ 127,000	09/01/91- 08/31/94
North Carolina State University Raleigh, NC 27695-7003 Title: Role of Novel Mannitol Dehydrogenase in Sink Metabolism and Salt Tolerance	D. Pharr M. Conkling	93-37304-8931	\$ 120,000	08/01/93 07/31/95
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Distribution and Activity of Dehydrin-like Proteins in Plants and Cyanobacteria	P. Lammers	93-37100-8920	\$ 65,000	08/01/93- 07/31/95
Agric. Expt. Station Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: Isolation of Genes Coding for Plant Polyamine Biosynthetic Enzymes	G. Phillips G. Kuehn S. Bagga	93-37301-9429	\$ 110,000	09/15/93- 09/30/95

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents University of Nevada System Reno, NV 89557 Title: Branched-Chain Monosaccharides in Leaves: Biochemistry and Environmental Responses	J. Seemann B. Moore	93-37306-9240	\$ 110,000	09/01/93- 08/31/95
Research Foundation of State University of New York Albany, NY 12201 Title: Pollen Development and Relevance of Heat Shock Proteins	J. Mascarenhas	92-37304-7869	\$ 15,000	09/01/92- 08/31/94
Research Foundation of State University of New York Albany, NY 12201 Title: Role of Ca ²⁺ in Detection of and Response to Salinity-induced Changes in Turgor	M. Bisson	93-37100-8872	\$ 110,000	09/01/93 08/31/95
Research Foundation of the State University of New York Buffalo, NY 14260 Title: Molecular Biology of C ₄ Photosynthesis in Grain Amaranth	J. Berry	93-37306-9041	\$ 65,000	09/01/93- 08/31/94
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Recent Changes in Nutrient Concentrations in the Northern Hardwood Forest	R. Yanai M. Arthur	93-37101-8582	\$ 228,273	05/15/93- 05/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Ozone-induced Changes in Seasonal Growth and Carbon Allocation in Sugar Maple	M. Topa	93-37100-8914	\$ 231,600	09/01/93-08/31/96
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853 Title: Approaches to Improve the UV-B Resistance of Arabidopsis thaliana	J. Sheahan	93-37100-8992	\$ 66,000	09/01/93-08/31/95
Cornell University Ithaca, NY 14853 Title: Cold-Regulated (COR) Proteins: Cryobehavior and Effects on Cryostability of Membranes	P. Steponkus	93-37100-8835	\$ 130,000	08/01/93-07/31/95
Cornell University Ithaca, NY 14853 Title: Molecular Mechanism of Nonphotochemical Quenching of Chlorophyll Excited States	T. Owens	93-37306-9042	\$ 100,000	09/01/93-08/31/95
Cornell University Ithaca, NY 14853 Title: Function and Regulation of Chloroplast REC-A Protein	A. Jagendorf	91-37301-6421	\$ 120,000	09/01/91-08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Siena College Loudonville, NY 12211-1462 Title: The Function of Small Heat Shock Proteins in the Endomembrane System	K. Helm	93-37100-9266	\$ 120,000	09/15/93- 09/30/96
The New York Botanical Garden Millbrook, NY 12545 Title: Carbohydrate Economy in Relation to Ecological Patterns of Tree Regeneration	C. Canham R. Chazdon	93-37100-8873	\$ 100,000	09/01/93- 08/31/95
New York University New York, NY 10003 Title: Characterization of Two Fd-GOGAT Genes and Their Roles in Photorespiration	K. Coschigano	93-37306-9285	\$ 70,000	09/15/93 09/30/95
Miami University Oxford, OH 45056 Title: Epidermal Flavonoids and UV-B Attenuation: Plant Responses to Ozone Depletion	J. McClure A. Huerta	93-37100-8836	\$ 130,000	07/01/93- 06/30/95
Oregon State University Corvallis, OR 97331 Title: Workshop on Stems and Trunks in Plant Form and Function	B. Gartner	93-37100-9063**	\$ 10,020	09/01/93- 06/30/94

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Pennsylvania State University University Park, PA 16802-1003 Title: Dendrochemical Detection of Soil Chemistry Trends Associated with Global Change	D. DeWalle W. Sharpe P. Edwards	93-37100-9164	\$ 100,000	09/01/93- 08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Linking O3-induced ACC Synthase, Loss in rbcS and Accelerated Foliar Senescence	E. Pell R. Arteca	93-37100-8921	\$ 190,000	09/01/93- 08/31/96
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Photosynthetic CO2 Fixation and Metabolism in Green Plants	S. Huber	93-37306-9006	\$ 12,000	09/01/93 08/31/94
Gordon Research Center Gordon Research Conferences Kingston, RI 02881 Title: Gordon Conference on Photosynthesis: Biochemical Aspects	B. Diner	93-37306-8969	\$ 12,000	08/01/93- 07/31/94
Brown University Providence, RI 02912 Title: Biosynthesis of Phycobilins	S. Beale	93-37306-9043	\$ 150,000	09/01/93- 08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
South Dakota State University Brookings, SD 57007 Title: Strategy to Identify Genes Linked Directly to Freeze Resistance	F. Sutton	93-37106-9381	\$ 50,000	09/15/93-09/30/95
Vanderbilt University Nashville, TN 37240 Title: Dynamics of Excitation Energy Storage in Allophycocyanin and C-Phycocyanin	W. Beck	93-37306-9044	\$ 110,000	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Induction of the Tonoplast H ⁺ -ATPase by ABA and NaCl	M. Binzel	93-37100-8951	\$ 100,000	09/01/93-08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Perception and Signaling of Physical Stress Cues in Maize Roots	P. Morgan W. Jordan	93-37100-8952	\$ 190,000	09/01/93-08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Metabolic Acclimation of Root Cells to Oxygen Deficiency	M. Drew B. Cobb D. Andrews	93-37100-8922	\$ 191,000	09/01/93-08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas A&M Research Foundation College Station, TX 77843 Title: Genes Induced by Plant Water Deficit	J. Mullet	93-37100-9014	\$ 190,000	09/01/93- 08/31/96
William Marsh Rice University Houston, TX 77251-1892 Title: Rice Field Management and Mitigation of Methane Emissions	R. Sass F. Fisher	91-37101-6814++	\$ 100,000	09/15/91- 09/30/94
Texas Tech University Lubbock, TX 79409-1035 Title: Oxidative Stress: Interactions Between Protective Enzymes in Chloroplasts	R. Allen A. Holaday	93-37100-8923	\$ 151,700	09/01/93 08/31/95
Texas Tech University Lubbock, TX 79409-1035 Title: Electron Flow in Photosynthetic Bacteria	D. Knaff	93-37306-9084	\$ 150,000	09/01/93- 08/31/96
Texas Tech University Lubbock, TX 79409-1035 Title: Purchase and Use of a Portable Photosynthesis System for Plant Stress Research	A. Holaday R. Allen	93-37311-9513	\$ 8,538	09/15/93- 09/30/94

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NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Utah Agric. Experiment Station Utah State University Logan, UT 84322 Title: Limitation of Nonsteady-state Photosynthesis by Rubisco	K. Mott	91-37306-6326	\$ 110,000	09/01/91- 08/31/95
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Nutrient Mediated Susceptibility of Red Spruce to Winter Injury	T. Perkins	93-37100-8994	\$ 120,000	09/01/93- 08/31/96
University of Vermont and State Agricultural College Burlington, VT 05405 Title: Acquisition of an Automated Ion Analyzer	D. Ross W. Jokela D. Wang J. Hughes	93-37106-9327	\$ 20,188	09/15/93- 09/30/94
Washington State University Pullman, WA 99164-5045 Title: Wind Effects of Canopy Conductance and the Mass and Energy Balance of Plant Communities	C. Stockle	93-37100-8953	\$ 120,000	09/01/93- 08/31/96
University of Washington Seattle, WA 98195 Title: Molecular Genetics of Populus: Collaborative Network	R. Stettler P. Heilman H. McNabb	92-37105-7764++	\$ 114,000	09/01/92- 08/31/94

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Tree Response to Elevated CO2 and Herbivory: Growth, Physiology and Insect Performance	E. Kruger R. Lindroth J. Volin	93-37100-8856	\$ 190,000	08/01/93- 07/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Genetics of Freezing Tolerance and Plasma Membrane Lipid Changes with Acclimation	J. Palta J. Bamberg	93-37100-8924	\$ 190,000	09/01/93- 08/31/96
The Medical College of Wisconsin, Inc. Milwaukee, WI 53226 Title: Regulated Enzymes in CO2 Fixation: Mechanisms of Activation and Catalysis	H. Miziorko	93-37306-9181	\$ 165,000	09/01/93 08/31/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Assessing UV-B Constraints on Photosynthetic Capacity: Linking Leaf Structure to Function	T. Day	93-37100-8875	\$ 155,100	09/15/93- 09/30/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Strengthening Environmental Change Research at West Virginia University	W. Peterjohn	93-37106-9329	\$ 19,900	09/15/93- 09/30/94

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Global Change

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Wyoming Laramie, WY 82071 Title: Influence of Leaf Anatomy and Growth Conditions on Photoinhibition Within Leaves	J. Nishio T. Vogelmann	93-37100-8855	\$ 210,000	08/01/93- 07/31/96

Total : \$ 9,218,446

CROSS-DIVISIONAL OR CROSS-PROGRAMMATIC TOPIC

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ANIMAL HEALTH RELATED RESEARCH

Awards listed in this section represent projects funded across the Animal Systems Programs. Such projects are focused within the guidelines of individual programs but deal with biotic and abiotic agents that are relevant to sustaining animal health and well-being and preventing animal disease.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Cloning of Genes Encoding Adhesin(s) and Agglutinating Antigen(s) of <i>M. gallisepticum</i>	V. Panangala V. van Santen	93-37204-9113	\$ 90,105	09/01/93- 08/31/96
The Regents of the University of California Davis, CA 95616-8671 Title: Spatial Epidemiology of Fowl Cholera in Turkeys	T. Carpenter K. Snipes	93-37204-9411	\$ 99,207	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: In vitro Characteristics of the Infection of Salmonid Lymphocytes with the <i>Microsporidium Enterocytozoon salmonis</i>	R. Hedrick	93-37204-9342	\$ 121,000	09/15/93- 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Characterization of a Hemolysin from <i>Haemophilus somnus</i>	S. Cole	93-37204-9215	\$ 197,000	09/15/93- 09/30/95
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Plasmid Mediated Virulence of <i>Salmonella dublin</i> Infection in Cattle	D. Guiney	93-37204-9602	\$ 235,000	09/15/93- 09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California, San Diego La Jolla, CA 92093-0003 Title: Rough Brucella as a Live Vaccine Strain for Expression of Foreign Antigen Genes	L. Corbeil	93-37204-9332	\$ 230,000	09/15/93- 09/30/96
Palo Alto Medical Fdn. for Health Care, Research & Education Palo Alto, CA 94301 Title: Protective Potential of Bradyzoite-specific Antigens of T.gondii	S. Parmley Y. Suzuki J. Remington	91-37204-6878	\$ 200,000	09/15/91- 09/30/95
Stanford Univerity Stanford, CA 94305-4125 Title: The Genetic Immunization of Salmonid Fish	R. Levine	93-37204-9564	\$ 90,215	09/15/93 09/30/95
USDA/ARS Northern Plains Area Fort Collins, CO 80525 Title: Molecular Biology of Culicoides variipennis Vector Competence for Arboviruses	W. Tabachnick K. Murphy	93-37204-9156	\$ 184,065	09/01/93- 08/31/96
University of Connecticut Storrs, CT 06269-2086 Title: Vesicular Stomatitis: The Virus, The Interferon System, and the Disease	P. Marcus M. Sekellick J. Lucas-Lenard	93-37204-9335	\$ 174,999	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Delaware Newark, DE 19716 Title: Equipment for Avian Research	C. Keeler	93-37208-9421	\$ 50,000	09/15/93- 09/30/94
University of Delaware Newark, DE 19716 Title: Characterization of a Putative Mycoplasma gallisepticum Cytadhesin	J. Dohms	93-37204-9114	\$ 110,000	09/15/93- 09/30/95
University of Florida Gainesville, FL 32611 Title: Antigenic Variation by Babesia bovis in Establishment of Chronic Infection	D. Allred	93-37204-9115	\$ 148,000	09/15/93 09/30/96
Tampa Bay Research Institute St. Petersburg, FL 33716 Title: Marek's Disease Virus: Analysis of Latency Associated Genes	A. Tanaka	93-37204-9337	\$ 232,558	09/15/93- 09/30/96
USDA/ARS South Atlantic Area Athens, GA 30613 Title: Fumonisin Alterations in Receptor-Mediated Regulation of Physiological Processes	S. Leggette R. Riley	93-37204-9199	\$ 100,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Georgia Research Foundation, Inc. Athens, GA 30602	F. Thompson N. Hill J. Stuedemann D. Dawe	93-37204-9207	\$ 250,000	09/15/93- 09/30/96
Title: Immunologic Modulation of Fescue Toxicosis				
Emory University Atlanta, GA 30322	J. Schroeder A. Merrill	93-37204-9339	\$ 78,527	09/15/93- 09/30/95
Title: Molecular Mechanism of Carcinogenesis Associated with Consumption of Fumonisin				
Iowa State University of Science and Technology Ames, IA 50011	J. Young G. Lindberg D. Beitz	93-37204-9343	\$ 180,000	09/15/93- 09/30/96
Title: Will Exogenous Glucagon Prevent Fatty Liver and Ketosis in Dairy Cows?				
USDA/ARS Mid-West Area Peoria, IL 61604	J. Goff R. Horst	93-37204-9334	\$ 80,000	09/15/93- 09/30/96
Title: Milk Fever Risk Factors: Dietary Cation-Anion Difference				
USDA/ARS Mid-West Area Peoria, IL 61604	L. Lee H. Kung R. Witter	93-37204-9340	\$ 193,481	09/15/93- 08/31/95
Title: MDV Transformation: Functional Analysis of an MDV Putative Oncogene				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Virulence Factors of Enterotoxigenic Escherichia coli	R. Isaacson	93-37204-9336	\$ 240,000	09/15/93- 09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: An Enterocyte Receptor for Porcine Rotavirus: Structure and Therapeutic Efficacy	M. Kuhlenschmidt H. Gelberg	93-37204-9563	\$ 180,925	09/15/93- 09/30/96
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Genetic and Mechanistic Analysis of Equine M(khi) Antiviral Gene	T. Chambers E. Bailey	93-37204-9341	\$ 195,198	09/15/93- 09/30/96
University of Massachusetts Amherst, MA 01003 Title: Analysis of Protective Immunity to Brucella abortus	C. Baldwin	93-37204-9494	\$ 190,252	09/15/93- 09/30/96
University of Massachusetts Worcester, MA 01605 Title: Use of Hemagglutinin-Expressing DNAs to Vaccinate Chickens for Influenza Virus	H. Robinson	93-37204-9116	\$ 248,063	09/01/93- 08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Maryland, Baltimore Baltimore, MD 21201 Title: The Characterization of a Potential Virulence Regulator from Staphylococcus aureus	K. Bayles	93-37207-9567	\$ 50,000	09/15/93-09/30/95
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Hormonal Modulation of Physiological Responses of Calves to Parasitism	T. Elsasser J. Sartin B. Blagburn R. Fayer	93-37204-9410	\$ 130,000	09/15/93-09/30/96
University of Maryland College Park, MD 20742 Title: Social Behavior, Stress and Well-Being in Laying Hens	J. Mench	93-37204-9333	\$ 121,000	09/15/93-09/30/96
American Society of Tropical Veterinary Medicine Laurel, MD 20707 Title: Request for Funding for ASTVM-93, Symposium on Heartwater Disease	K. Kocan	93-37204-8356	\$ 5,000	02/01/93-01/31/94
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Impact of Disease on Morbidity, Mortality and Carcass Characteristics of Growing Swine	W. Marsh G. Dial P. Davies	93-37204-9208	\$ 215,000	09/15/93-09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Anti-Cytokine Therapy for Prevention and Treatment of Respiratory Disease	M. Murtaugh M. Baarsch	93-37204-9338	\$ 182,000	09/15/93- 09/30/95
The Curators of the University of Missouri Columbia, MO 65211 Title: Immunoglobulin Isotype Regulation in the Bovine: Role of T Cell Derived Cytokines	D. Estes	93-37204-9601	\$ 200,000	09/15/93- 09/30/96
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: An Epidemiologic Study of Proliferative Gill Disease in Channel Catfish	L. Pote	93-37204-9117	\$ 98,360	09/15/93 09/30/96
Mississippi State University Mississippi State, MS 39762 Title: Genetic Diversity of Bovine Immunodeficiency Virus in Naturally Infected Cattle	K. St. Cyr-Coats	93-37208-9223	\$ 49,863	09/15/93- 09/30/95
North Carolina State University Raleigh, NC 27695-7003 Title: Nutritional Factors Modulating Ovarian Function in Ruminants	J. Armstrong C. Farin R. Harvey	93-37203-9163	\$ 232,000	09/01/93- 08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105 Title: Molecular Mechanism of Cytopathogenicity of Bovine Viral Diarrhea Virus	F. Qi E. Berry	93-37204-9212	\$ 149,619	09/01/93-08/31/95
University of North Dakota, School of Medicine Grand Forks, ND 58202 Title: Glutathione Metabolism and Fumonisin Cytotoxicity	Y. Kang	93-37208-9277	\$ 50,000	09/01/93-08/31/95
Cornell University Ithaca, NY 14853 Title: Pathogenesis of Retroviral Diseases in Fish	P. Bowser J. Casey	93-37204-9214	\$ 160,331	09/01/93-08/31/95
Cornell University Ithaca, NY 14853 Title: Bovine Leukemia Virus Tumorigenesis in the SCID Mouse	J. Casey	93-37204-9213	\$ 177,680	09/01/93-08/31/96
Ohio State University Research Foundation Columbus, OH 43210 Title: Induced Lactogenic Immunity in Cows by Rotavirus Proteins or Viruslike Particles	L. Saif K. Smith	93-37204-9201	\$ 264,933	09/01/93-08/31/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agricultural Expt. Station Oklahoma State University Stillwater, OK 74078 Title: Control of Virulence in an Intracellular Pathogen	R. Essenberg	93-37204-9210	\$ 179,000	09/01/93- 08/31/96
Oregon State University Corvallis, OR 97331 Title: Functional Analysis of Proteasome Gene Expression	N. Forsberg	93-37204-9294	\$ 84,483	09/15/93- 09/30/95
Trustees of the University of Pennsylvania Philadelphia, PA 19104 Title: Development of Bovine Herpesvirus 1 as a Vector for Expression of Foreign Genes	W. Lawrence L. Bello	93-37204-9203	\$ 256,977	09/15/93- 09/30/95
Pennsylvania State University University Park, PA 16802-1003 Title: Mechanisms of Cytokine-Mediated Mammary Immune Cell Regulation	L. Sordillo	93-37204-9206	\$ 100,000	09/01/93- 08/31/95
University of Rhode Island Kingston, RI 02881 Title: Immunological Assessment of Hybrid Striped Bass at Three Culture Temperatures	R. Carlson R. Wolke	93-37208-9280	\$ 50,000	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Rhode Island Kingston, RI 02881 Title: Mucus Regulated Genes and Proteins of <i>Vibrio anguillarum</i>	D. Nelson	93-37207-9416	\$ 49,976	09/15/93- 09/30/95
Medical University of South Carolina Charleston, SC 29425 Title: Vaccination Against Cryptocaryon	E. James	93-37208-9419	\$ 50,000	09/15/93- 09/30/95
Clemson University Clemson, SC 29634-5326 Title: Origin of Turkey Spermiphages and Their Effects on Semen Quality	R. Thurston T. Scott	93-37203-9408	\$ 75,000	09/15/93 09/30/96
South Dakota State University Brookings, SD 57007 Title: Consequences of Interaction of Bovine Herpesviruses with Mononuclear Leukocytes	C. Chase D. Hurley	93-37208-9281	\$ 50,000	09/15/93- 09/30/95
University of Tennessee Knoxville, TN 37996-0140 Title: Significance of Strain Variation Within the Ruminant Respiratory Syncytial Viruses	L. Potgieter	93-37204-9211	\$ 123,310	09/01/93- 08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Agricultural Expt. Station University of Tennessee Knoxville, TN 37901-1071 Title: Purification and Characterization of Bovine Lipopolysaccharide Binding Protein	P. Bochsler	93-37204-9200	\$ 184,000	09/01/93- 08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Characterization of Bovine T Cell Subsets by Cytokine Production	W. Brown	93-37206-9075	\$ 260,000	09/01/93- 08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Effect of in utero Maternal Stress on the Calf's Response to Later Stressors	T. Friend R. Randel	93-37204-9293	\$ 145,000	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: Ascites Syndrome in the Broiler Chicken: Cellular and Hemodynamic Implications	T. Odom J. Jeffrey	93-37204-9299	\$ 91,000	09/01/93- 08/31/95
Texas A&M Research Foundation College Station, TX 77843 Title: RNA Recombination: A Mechanism for the Evolution of New IBV Strains	E. Collisson	93-37204-9296	\$ 165,560	09/01/93- 08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
 Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas A&M Research Foundation College Station, TX 77843 Title: T Cell Responses to Tegument Antigens of Fasciola hepatica	A. Ficht	93-37204-9492	\$ 260,000	09/15/93-09/30/96
Texas A&M Research Foundation College Station, TX 77843 Title: Genetic Resistance to Bovine Brucellosis, Tuberculosis, and Salmonellosis	J. Templeton L. Adams	93-37204-9491	\$ 190,748	09/15/93-09/30/95
Agricultural Expt. Station Texas A&M University System College Station, TX 77843 Title: Induction by Recombinant Antigens of Functional Immunity to the Enteric Pathogen Trichinella spiralis	P. Lyons	93-37204-9493	\$ 152,306	09/15/93-09/30/95
Baylor College of Medicine Houston, TX 77030 Title: Regulation of Pasteurella haemolytica Leukotoxin Expression	S. Highlander	93-37204-9295	\$ 270,000	09/15/93-09/30/96
Texas Tech University Health Sciences Ctr. Lubbock, TX 79430 Title: Investigation of Feeding Motivation as a Cause of Stereotyped Behavior in Gilts	J. McGlone R. Norman	93-37204-9412	\$ 215,000	09/15/93-09/30/96

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Vermont and State Agricultural College Burlington, VT 05405	A. Bramley I. Politis B. Zavizion	93-37204-9216	\$ 100,000	09/01/93- 08/31/95
Title: Interactions Between Bovine Epithelial Cells and Mastitis Pathogens				
Washington State University Pullman, WA 99164-5045	S. Ristow S. LaPatra T. Baldwin	93-37204-9297	\$ 165,003	09/01/93- 08/31/96
Title: Induction and Evaluation of Mucosal Immunity in Trout Vaccinated with IHNV Antigens				
Washington State University Pullman, WA 99164-5045	S. Hines L. Perry S. Kanaly	93-37204-9298	\$ 138,000	09/01/93- 08/31/95
Title: Rhodococcus equi pneumonia: Mechanisms of Immune Clearance				
Washington State University Pullman, WA 99164-5045	C. Wyatt L. Perryman	93-37204-9300	\$ 253,000	09/15/93- 09/30/96
Title: Mechanism of Intestinal Lesion Development in Bovine Cryptosporidiosis				
Board of Regents of the University of Wisconsin System Madison, WI 53706	L. Armentano R. Grummer	93-37204-9202	\$ 76,837	09/15/93- 09/30/95
Title: Effect of Intra-Hepatocyte Triglyceride Accumulation on Specific Hepatic Functions in the Bovine				

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Health Related Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Immunological Rationale for a BHV-1 Peptide Vaccine	G. Splitter	93-37204-9205	\$ 213,764	09/01/93- 08/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Bovine IL-1 Receptors: Regulation, Signal Transduction, and Molecular Cloning	C. Czuprynski L. Schuler	93-37204-9204	\$ 275,000	09/01/93- 08/31/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Role of Bovine T Cells in the Pathogenesis of Mycobacterial Infections	M. Collins C. Czuprynski	93-37204-9198	\$ 235,000	09/15/93 09/30/96
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: Genetic Organization and Regulation in Leptospira interrogans	D. Yelton	93-37204-9209	\$ 100,000	09/01/93- 08/31/95

Total : \$ 10,693,345

CROSS-DIVISIONAL OR CROSS-PROGRAMMATIC TOPIC

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**ANIMAL GENETIC RELATED RESEARCH
(Animal Genome)**

Awards listed in this section represent projects funded across the Animal Systems Programs. Such projects are focused within the guidelines of individual programs but aim to increase our understanding of the structure, organization, function, regulation, and expression of genes in agriculturally important animals.

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Alaska Fairbanks, AK 99775 Title: Genetics of Pink Salmon Growth	P. Crandell	93-37206-9120	\$ 100,000	09/15/93- 09/30/95
Auburn University Auburn University, AL 36849 Title: Improvement of Growth by Expression rtGH and Selection in Transgenic Catfish	R. Dunham	93-37205-9073	\$ 230,144	09/15/93- 09/30/96
University of Alabama Birmingham, AL 35294-2010 Title: Molecular Regulatory Mechanisms of LH Secretion in Cattle	J. Neill C. Rahe S. Kakar	93-37203-9067	\$ 262,000	09/15/93- 09/30/96
Stanford University Stanford, CA 94305-4125 Title: The Genetic Immunization of Salmonid Fish	R. Levine	93-37204-9564	\$ 90,215	09/15/93- 09/30/95
Wesleyan University Middletown, CT 06457 Title: Regulation of the a2(I) Collagen Gene in Cartilage Cells by Shifting the RNA Start Site	L. Lukens	93-37206-9495**	\$ 169,520	09/15/93- 09/30/96

** Split Funded Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Florida Gainesville, FL 32611 Title: Control of Endometrial Expression of the Porcine IGFBP-2 Gene	F. Simmen R. Simmen	93-37205-9172	\$ 119,796	09/15/93- 09/30/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: International Conference on Comparative Gene Mapping (CGTAV)	H. Lewin	93-37205-9118	\$ 5,000	09/01/93- 08/31/94
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Towards a 20 cM Map of the Bovine Genome	H. Lewin	91-37205-6335++	\$ 124,076	09/01/91 08/31/94
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: An Enterocyte Receptor for Porcine Rotavirus: Structure and Therapeutic Efficacy	M. Kuhlenschmidt H. Gelberg	93-37204-9563	\$ 180,925	09/15/93- 09/30/96
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Genetic and Mechanistic Analysis of Equine M(khi) Antiviral Gene	T. Chambers E. Bailey	93-37204-9341	\$ 195,198	09/15/93- 09/30/96

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Massachusetts Amherst, MA 01003 Title: Physical Mapping of the Bovine Genome	F. Ponce de Leon J. Robl	93-37205-9565	\$ 220,913	09/15/93- 09/30/96
Worcester Polytechnic Institute Worcester, MA 01609 Title: Homeobox Genes as Molecular Markers in <i>Penaeus vannamei</i>	J. Bagshaw	93-37208-9568	\$ 50,000	09/15/93- 09/30/95
USDA/ARS Beltsville Area Beltsville, MD 20705 Title: Production and Use of a Swine Chromosome 6 Genomic Library	J. Lunney	93-37205-9119	\$ 222,220	09/01/93 08/31/95
Advanced Bioscience Labs, Inc. NCI - Frederick Cancer Research Facilities Frederick, MD 21701-1013 Title: Establishment of Totipotent Cells from Postimplantation Embryos	J. Resnick P. Donovan	93-37205-9074	\$ 154,084	09/15/93- 09/30/96
Michigan State University East Lansing, MI 48824 Title: Genetic and Physical Maps of the Chicken Genome	J. Dodgson L. Crittenden	93-37205-9344	\$ 134,038	09/15/93- 09/30/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Mapping Major Genes for Growth and Reproductive Traits in Swine	L. Schook M. Wheeler	93-37205-9345	\$ 317,068	09/15/93- 09/30/96
Duke University Medical Center Durham, NC 27710 Title: Growth Inhibitory Factors in the Porcine Ovarian Follicle	D. Schomberg	93-37203-9610	\$ 227,000	09/15/93- 09/30/96
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Regulated Expression of the GnRH Gene in Ruminants	D. Hamernik	93-37203-9490	\$ 126,000	09/15/93 09/30/95
Rutgers, The State University Piscataway, NJ 08855-1089 Title: Intraovarian Role of Relaxin in Follicular Development	C. Bagnell	93-37203-8979	\$ 236,000	08/15/93- 08/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Isolation and Characterization of Embryonic Stem (ES) Cells from Bovine Embryos	J. Piedrahita	93-37205-9217	\$ 65,031	09/01/93- 08/31/95

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Baylor College of Medicine Houston, TX 77030 Title: Identification of DNA Sequences Required to Target Proteins to the Mammary Gland	J. Rosen	92-37205-8263++	\$ 100,000	09/15/92-09/30/94
University of Texas M.D. Anderson Cancer Center Houston, TX 77030 Title: Genetic Linkage Maps of Aquacultured Catfishes	D. Morizot	93-37205-9413	\$ 212,209	09/15/93-09/30/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Effects of Insulin-like Growth Factor-I Transgenes on Bovine Mammary Cell Growth and Differentiation	R. Akers E. Wong	93-37206-9354	\$ 97,500	09/15/93-09/30/95
Northwest Fisheries Sci. Ctr. National Marine Fisheries Service, U.S. Dept. of Commerce Seattle, WA 98112 Title: Regulation of Fish Reproduction: Gonadotropins and Their Receptors	P. Swanson	93-37203-9409	\$ 222,000	09/15/93-09/30/96
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Mapping Bovine Anchor Loci - Expanding the Comparative Linkage Map	B. Kirkpatrick	93-37205-9173	\$ 160,452	09/01/93-08/31/96

++ Continuation Award

NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM
Animal Genome

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Wisconsin Milwaukee, WI 53201 Title: Isolation and Characterization of the Sex-determining Region of Salmonid Fishes	K. Reed	93-37205-9171	\$ 74,692	09/01/93- 08/31/95

Total : \$ 4,096,081

**BIOTECHNOLOGY RISK ASSESSMENT RESEARCH GRANTS
PROGRAM**

The authority for the Program is contained in Section 1668 of the Food, Agriculture, Conservation, and Trade Act of 1990 (7 U.S.C. 5921). This program supports biotechnology risk assessment research to help address concerns about the effects of introducing certain biotechnology products into the environment and to help regulators develop policies concerning the introduction of such products. Proposals may be submitted by any public or private research educational institution or organization.

Biotechnology Risk Assessment Research Grants Program
Biotechnology Risk Assessment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Risk Assessment of a Plant-Associated Bacterium Genetically Engineered with Lux Genes	J. Kloepper J. Shaw	93-33120-9472**	\$ 137,000	09/15/93- 09/30/95
University of Arkansas Fayetteville, AR 72701 Title: Sexual Cycle and Potential for Gene Flow in Fungal Biological Control Agents	D. TeBeest C. Cisar	93-33120-9473**	\$ 100,000	09/15/93- 09/30/95
The Regents of the University of California Davis, CA 95616-8671 Title: Risk Assessment: Recombination Events Between Virus Genomes and Genome Segments in Plants	B. Falk G. Bruening	93-33120-9469**	\$ 230,000	09/15/93 09/30/96
USDA/ARS Northern Plains Area Fort Collins, CO 80525 Title: Risk of Transgenic Alfalfa Dissemination During Seed Production	D. Skinner	93-33120-9474**	\$ 72,000	09/15/93- 09/30/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Genetic Exchange Between Bacillus thuringiensis and Other Microbes in Soil	R. Andrews T. Loynachan	93-33120-9467**	\$ 160,000	09/15/93- 09/30/96

** Split Funded Award

Biotechnology Risk Assessment Research Grants Program
Biotechnology Risk Assessment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Idaho Moscow, ID 83843 Title: Model for Dispersal and Epiphytic Survival of Bacteria Applied to Crop Foliage	G. Knudsen L. Dandurand	93-33120-9470**	\$ 106,704	09/15/93- 09/30/95
University of Idaho Moscow, ID 83843 Title: Gene Transfer Between Transgenic Canola (Brassica napus) and Related Weed Species	J. Brown C. Mallory-Smith D. Thill	93-33120-9471**	\$ 234,996	09/15/93- 09/30/96
USDA/ARS Mid-West Area Peoria, IL 61604 Title: Crossability Relationships Between Potato Varieties and Related Wild Species	R. Hanneman	93-33120-9592**	\$ 115,000	09/15/93 09/30/96
Indiana University Bloomington, IN 47402 Title: Gene Flow Between Domesticated and Wild Sunflowers	L. Rieseberg A. Snow	93-33120-9466**	\$ 180,000	09/15/93- 09/30/96
Purdue Research Foundation West Lafayette, IN 47907 Title: Adaptability and Genetic Stability of Transgenic Fish in Artificial Environments with Implications to Native Habitats	W. Muir R. Howard C. Bidwell	93-33120-9468**	\$ 177,656	09/15/93- 09/30/96

** Split Funded Award

Biotechnology Risk Assessment Research Grants Program
Biotechnology Risk Assessment

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of South Carolina Columbia, SC 29208 Title: Identification of Plant Viral Synergism Genes	V. Vance	93-33120-9475**	\$ 130,000	09/15/93- 09/30/96

Total : \$ 1,643,356

** Split Funded Award

SPECIAL RESEARCH GRANTS PROGRAM

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The objective of this grant program is to carry out research to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation.

A brief description of the research areas in the Special Research Grants Program follows with a listing of research grants awarded in FY 1993.

This program is administered under the authority of Section 2(c) (1) of P.L. 89-106, as amended. Eligible institutions include land-grant colleges and universities, State agricultural experiment stations, and all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals having a demonstrable capacity in food and agricultural research.

AQUACULTURE SPECIAL RESEARCH GRANTS PROGRAM

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The purpose of the program is to enhance the knowledge and technology base necessary for the continued growth of the domestic aquaculture industry as a form of production agriculture. Emphasis is placed on research leading to improved production efficiency and increased competitiveness of private sector aquaculture consistent with wise environmental stewardship. In Fiscal Year 1993 the program focused on the characterization of aquaculture waste and the reduction of waste through improved feeds and feeding strategies.

Special Research Grants Program
 Aquaculture Research (General)

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Changing Feeds and Feeding Strategies to Improve Waste Management in Catfish Ponds	R. Lovell C. Boyd	93-34123-9098	\$ 61,047	09/01/93- 08/31/96
University of Maryland College Park, MD 20742 Title: Reducing Aquacultural Waste Generation and Discharge	F. Wheaton J. Soares	93-34123-9099	\$ 196,307	09/15/93- 09/30/95
University of Maryland - Eastern Shore Princess Anne, MD 21853 Title: Management of Phosphorus Discharge Through Alternative Fish Feed Technology	T. Handwerker S. Hughes	93-34123-9097	\$ 41,002	09/15/93 03/31/95

Total : \$ 298,356

WATER QUALITY SPECIAL RESEARCH GRANTS PROGRAM

As part of the National Initiative on Water Quality, the Cooperative State Research Service Water Quality Special Research Grants Program seeks to fund research to improve and expand knowledge about the relationships between agricultural practices and water quality. The goals of this program are to develop basic principles and to understand the processes underlying soil and/or water quality degradation originating from agricultural practices that use certain pesticides, fertilizers, and waste products. The capabilities to accurately and economically sample, interpret and predict occurrence of residual contamination of soils and water are to be developed for croplands, farmsteads, and forestlands. Results should be transferable to different soil, cropping areas, and size scales. The research should contribute to a better understanding of sociological, economic, and policy implications of water contamination or its prevention. Ultimately, effective and economically feasible avoidance and remedial technologies are needed to prevent or correct agriculturally-induced soil and water quality problems which should result in a more sustainable agriculture. Also, included in this program are studies on soil and plant testing methods, and adoption of improved practices to reduce leaching of nitrate into water supplies. Special focus is given on evaluation and improvement of current tests of nitrogen availability to crops, development of new nitrogen tests and farm-scale recommendations for nitrogen management.

Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Auburn University Auburn University, AL 36849 Title: Evaluation of Nitrogen and Phosphorus Bio-Availability Indices for Poultry Wastes	C. Wood W. Kingery	93-34214-8948	\$ 139,995	08/01/93- 01/31/96
Auburn University Auburn University, AL 36849 Title: Technology to Prevent Nitrate Contamination of Groundwater Under Grain Crops	C. Wood D. Reeves D. Delaney	92-34214-8074++	\$ 27,582	09/15/92- 09/30/94
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Empore Disk Extraction Investigations: Field Extraction Equipment, Stabilization of Pesticides After Extraction	T. Lavy J. Mattice B. Skulman	93-34214-8851	\$ 90,229	08/01/93 07/31/95
The Board of Trustees University of Arkansas Fayetteville, AR 72701 Title: Assessing Midseason, Nitrogen Requirements of Rice Using Canopy Image Analysis	W. Casady T. Costello	92-34214-8075++	\$ 27,600	09/15/92- 09/30/94
University of Arizona Tucson, AZ 85721 Title: Development of Best Management Practices for Nitrogen and Water Use in Irrigated Broccoli and Cauliflower Production	T. Doerge T. Thompson	92-34214-8153++	\$ 27,593	09/15/92- 09/30/94

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 Title: Fertilizer Management and Plant Nitrogen Testing in Deciduous Orchard Crops	P. Brown S. Weinbaum	92-34214-8155++	\$ 26,779	09/15/92- 09/30/94
The Regents of the University of California Davis, CA 95616-8671 Title: Economic Cost-Benefit Analysis and Technical Education for Adoption of Nitrogen Testing Programs in Large-Scale Vegetable	L. Jackson K. Tanji	92-34214-8154++	\$ 27,355	09/15/92- 09/30/94
USDA/ARS Northern Plains Area Fort Collins, CO 80525 Title: In Situ Bioremediation of High Nitrate Well Water by Vegetable Oil Injection	W. Hunter R. Follett	93-34214-8949	\$ 31,110	09/15/93 09/30/95
Colorado State University Ft. Collins, CO 80523 Title: Conjunctive Management of Irrigation Water and Nitrogen Fertilizer for Protection of Groundwater Quality	G. Cardon H. Duke W. Bausch D. Westfall	93-34214-9059	\$ 146,718	09/01/93- 08/31/96
Colorado State University Ft. Collins, CO 80523 Title: Reducing Nitrate Leaching Through In-Season Soil Nitrate and Leaf Chlorophyll Testing	P. Soltanpour	92-34214-8156++	\$ 27,372	09/15/92- 03/31/95

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Connecticut Agricultural Experiment Station New Haven, CT 06504 Title: Treatment of Pesticide Wastes in Soil and Water with Fenton-type Oxidants	J. Pignatello	93-34214-8950	\$ 135,978	09/15/93- 09/30/96
University of Florida Gainesville, FL 32611 Title: Integration of Spatio-temporal Variability for Field-Scale Predictions of Groundwater Contamination	W. Graham P. Rao	93-34214-8807	\$ 145,350	08/01/93- 07/31/96
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Monitoring Nitrate in Soil in situ Using Inexpensive Coated Wire Electrodes	L. Shuman	92-34214-8157++	\$ 23,111	09/15/92 09/30/94
University of Georgia Research Foundation, Inc. Athens, GA 30602 Title: Evaluation of Tools for Assessing the Accuracy of Poultry Manure Applications on Agricultural Lands in the Southeast	D. McCracken G. Gascho D. NeSmith C. Douglas	93-34214-8894	\$ 67,102	09/01/93- 08/31/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Constructed Wetlands to Remove Nitrate-nitrogen From Subsurface Cropland Drainage	J. Baker W. Crumpton	93-34214-8850	\$ 150,000	08/01/93- 07/31/96

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011	J. Swan R. Horton D. Jaynes	93-34214-8849	\$ 71,040	09/01/93- 08/31/95
Title: Automated System for Measuring Water and Solute Transport Under Transcient Flow Conditions				
Iowa State University of Science and Technology Ames, IA 50011	J. Baker J. Hatfield	90-34214-5318	\$ 360,000	07/15/90- 07/31/94
Title: Evaluation of the Impact of Current and Emerging Farming Systems on Water Quality				
Iowa State University of Science and Technology Ames, IA 50011	J. Baker J. Hatfield	90-34214-5318	\$ 3,200	07/15/90 07/31/94
Title: Evaluation of the Impact of Current and Emerging Farming Systems on Water Quality				
Iowa State University of Science and Technology Ames, IA 50011	R. Killorn	92-34214-8076++	\$ 25,774	09/15/92- 09/30/94
Title: Assessment of Soil Nitrogen Tests in Animal-Based Farming Systems: Iowa				
Land O'Lakes, Inc. Webster City, IA 50595	D. Ivers P. Clayton R. Beck	93-34214-9060	\$ 150,000	08/15/93- 08/31/96
Title: Integrated Dairy Waste Management, Water Quality and Crop Utilization System				

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Idaho Moscow, ID 83843	B. King I. McCann J. Stark	93-34214-8861	\$ 149,319	08/01/93- 07/31/96
Title: Site-Specific Crop Management for Improved Water and Chemical Use Efficiency				
Purdue Research Foundation West Lafayette, IN 47907	B. Engel D. Jones	93-34214-8934	\$ 140,452	08/01/93- 07/31/95
Title: Technique for Developing Groundwater Vulnerability to Nitrate Maps for Large Areas				
Purdue Research Foundation West Lafayette, IN 47907	D. Mengel	93-34214-8935	\$ 135,658	09/01/93 08/31/95
Title: The Role of Cropping Systems in the Movement of Plant Nutrients to Surface Water				
Purdue Research Foundation West Lafayette, IN 47907	R. Turco E. Kladviko	93-34214-8936	\$ 122,242	09/01/93- 08/31/95
Title: Microbial Activity and Pesticide Degradation Near Tile Drains				
Purdue Research Foundation West Lafayette, IN 47907	M. Morgan	92-34214-8158++	\$ 26,983	09/15/92- 09/30/94
Title: A Real-Time Soil Nitrate Sensor				

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Kansas State University Manhattan, KS 66506	J. Havlin C. Rice G. Kluitenberg	93-34214-8937	\$ 58,973	09/01/93- 08/31/95
Title: Use of Nitrogen Mineralization in Spatially Variable Nitrogen Recommendations				
Kansas State University Manhattan, KS 66506	R. Oberst D. Mosier J. Galland G. Marchin	93-34214-9159	\$ 105,261	09/01/93- 08/31/96
Title: Amplification of Cryptosporidium DNA Assessing Agricultural Waste				
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803	G. Breitenbeck	92-34214-8077++	\$ 26,532	09/15/92 09/30/94
Title: Development of a N Test for Cotton Grown in the Humid Southeast				
University of Massachusetts Amherst, MA 01003	S. Herbert A. Barker L. Moffitt F. Mangan	93-34214-8853	\$ 149,682	08/01/93- 07/31/96
Title: Nitrate Leaching in Alternate Cover Crop Systems				
Michigan State University East Lansing, MI 48824	A. Smucker V. Snow	93-34214-9157	\$ 138,809	09/01/93- 08/31/95
Title: Root Modification of Preferential Flow and Solute Mobility in Subirrigated Agriculture				

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Subsurface Water Quality Under Potato Production in Glacial Outwash Soil	S. Gupta J. Moncrief C. Rosen	93-34214-8864	\$ 149,995	09/01/93- 08/31/96
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Midwest Initiative on Water Quality: Northern Cornbelt Sand Plain Proposal	J. Anderson	90-34214-5317	\$ 360,000	07/01/90- 06/30/94
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Tillage and Nutrient Effects on the Water Quality of Tile Drainage	D. Huggins J. Moncrief S. Gupta	93-34214-8862	\$ 149,839	09/01/93 08/31/96
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Fate of Herbicides During Composting	P. Bloom B. Cook H. Cheng T. Halbach	93-34214-8865	\$ 128,380	09/15/93- 09/30/95
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Petiole Sap Nitrate Test for Predicting Nitrogen Needs of Irrigated Potatoes	C. Rosen C. Reece	92-34214-8159++	\$ 27,582	09/15/92- 09/30/94

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Midwest Initiative on Water Quality: Northern Cornbelt Sand Plain Proposal	J. Anderson	90-34214-5317	\$ 3,200	07/01/90- 06/30/94
The Regents of the University of Minnesota Minneapolis, MN 55415 Title: Assessment of Soil Nitrogen Tests in Animal-Based Farming Systems: Minnesota	G. Randall M. Schmitt	92-34214-8160++	\$ 25,056	09/15/92- 09/30/94
The Curators of the University of Missouri Columbia, MO 65211 Title: Alternative Management Systems for Enhancing Water Quality in an Aquifer Underlying Claypan Soils	A. Prato N. Kitchen	90-34214-5319	\$ 360,000	07/15/90 07/31/94
The Curators of the University of Missouri Columbia, MO 65211 Title: Sensors and Methods for Variable Rate Nitrogen Recommendations on Claypan Soils	N. Kitchen K. Sudduth	93-34214-8866	\$ 146,793	08/01/93- 07/31/96
The Curators of the University of Missouri Columbia, MO 65211 Title: Alternative Management Systems for Enhancing Water Quality in an Aquifer Underlying Claypan Soils	A. Prato	90-34214-5319	\$ 3,237	07/15/90- 07/31/94

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: Use of Constructed Wetlands to Improve Water Quality in Finfish Pond Culture	M. LaSalle J. Homziak B. Posadas	93-34214-8842	\$ 140,749	08/01/93- 02/28/95
Montana State University Bozeman, MT 59717 Title: Solute Transport Model Validation: Evaluation of Temporal and Scale Effects	W. Inskeep J. Wraith J. Wilson	93-34214-8895	\$ 149,363	09/01/93- 08/31/95
Montana State University Bozeman, MT 59717 Title: Resin Capsule Test for N Availability to Crops and Leaching Potential	E. Skogley R. Lockerman	92-34214-8161++	\$ 27,075	09/15/92 09/30/94
North Carolina State University Raleigh, NC 27695-7003 Title: Computer Aid for Environmentally and Economically Sound Weed Management	G. Wilkerson J. Weber H. Coble	93-34214-8911	\$ 149,004	09/01/93- 08/31/96
North Carolina State University Raleigh, NC 27695-7003 Title: Developing an Enzymatic Assay for Predicting N Release from Organic Residues	R. Mikkelsen A. Wollum	92-34214-8163++	\$ 24,390	09/15/92- 09/30/94

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Management of Irrigated Corn and Soybeans to Minimize Ground Water Contamination	D. Watts R. Spalding	90-34214-5218	\$ 360,000	07/01/90- 06/30/94
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Sprinkler Irrigation as a Remedial Technique for VOC- Contaminated Groundwater	R. Spalding D. Martin M. Exner D. Alexander	93-34214-8897	\$ 147,249	08/01/93- 07/31/95
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Factors Influencing Spatial Yield and N Use Efficiency of Furrow -Irrigated Corn	R. Ferguson G. Hergert J. Cahoon T. Peterson	93-34214-8896	\$ 149,854	08/01/93- 07/31/96
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Calibration of Residual Soil Nitrate for Predicting Supplemental N for Sorghum	D. Sander K. Frank E. Penas	92-34214-8162++	\$ 20,870	09/15/92- 09/30/94
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Management of Irrigated Corn and Soybeans to Minimize Ground Water Contamination	D. Watts R. Spalding	90-34214-5218	\$ 3,200	07/01/90- 06/30/94

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Dartmouth College Hanover, NH 03755 Title: Impact of Geological Uncertainty on Management Alternatives to Agricultural Drains	K. Belitz S. Gorelick	93-34214-8847	\$ 126,000	08/01/93- 07/31/96
New Mexico Inst. of Mining and Technology Socorro, NM 87801 Title: Development and Testing of a 2-D Model of Nutrient and Pesticide Transport	R. Bowman J. Hendrickx	93-34214-8898	\$ 149,755	09/01/93- 08/31/95
Cornell University Ithaca, NY 14853 Title: Liposome Immuno-migration Sensor for Field Monitoring of Surface and Ground Water Contamination	R. Durst	93-34214-8846	\$ 60,000	08/01/93 07/31/94
Cornell University Ithaca, NY 14853 Title: Evaluation of Soil Test Nitrogen Procedures in Maize Based Cropping Systems	J. Duxbury S. Klausner	92-34214-8234++	\$ 27,599	09/15/92- 09/30/94
Ohio State University Research Foundation Columbus, OH 43210 Title: The Ohio Buried Valley Aquifer Management Systems Evaluation Area	A. Ward E. Bair T. Logan	90-34214-5175	\$ 360,000	07/01/90- 06/30/94

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Ohio State University Research Foundation Columbus, OH 43210-1063 Title: Basic Evaluation and Simulation Tool for Agricultural Water Quality (BESTAQUA)	F. Hadipriono A. Ward T. Logan	93-34214-8843	\$ 140,000	09/01/93-08/31/95
Ohio State University Research Foundation Columbus, OH 43210-1063 Title: Calibrating the Presidedress N Soil Test for Specific Cropping Conditions	D. Eckert	92-34214-8235++	\$ 27,722	09/15/92-09/30/94
Ohio State University Research Foundation Columbus, OH 43210 Title: The Ohio Buried Valley Aquifer Management Systems Evaluation Area	A. Ward E. Bair T. Logan	90-34214-5175	\$ 3,200	07/01/90-06/30/94
Agricultural Expt. Station Oklahoma State University Stillwater, OK 74078 Title: Evaluation of Hydrologic/Water Quality Models	C. Haan G. Sabbagh D. Storm	93-34214-8852	\$ 150,000	08/15/93-08/31/95
Oregon State University Corvallis, OR 97331 Title: Evaluation of Irrigation Strategies for Regional Ground Water Quality Management	M. English G. Perry C. Chen	93-34214-8899	\$ 148,808	09/01/93-08/31/95

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Oregon State University Corvallis, OR 97331 Title: Denitrifying Activity in Deep Soil Profiles	D. Myrold	93-34214-8900	\$ 124,649	09/01/93-08/31/95
Pennsylvania State University University Park, PA 16802-1003 Title: Nitrate Leaching in Intensively Managed Pastures Grazed by Dairy Cows	S. Fales R. Fox L. Muller J. Hamlett	93-34214-8912	\$ 133,523	09/01/93-08/31/96
Pennsylvania State University University Park, PA 16802-1003 Title: Developing Tests to More Accurately Predict Economic Optimum N Rates for Corn - Year 2	R. Fox	92-34214-8078++	\$ 28,187	09/15/92-09/30/94
Pennsylvania State University University Park, PA 16802-1003 Title: Karst Geology Agrochem Transport Model with GIS Organization and Visualization	D. Kurtz R. Parizek R. Day	93-34214-9599	\$ 149,999	09/15/93-09/30/95
Pennsylvania State University University Park, PA 16802-1003 Title: Identification of Barriers to Adoption/Diffusion of Nitrogen Availability Tests	T. Rollins D. Beegle G. Roth R. Fox	92-34214-8164**	\$ 32,600	09/15/92-09/30/94

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** Continuation Split Funded Award

Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of Rhode Island Kingston, RI 02881 Title: Spatial Modeling of N-Leaching and the Economics of Aquifer Protection	J. Gorres J. Opaluch A. Gold	93-34214-8845	\$ 136,800	08/01/93- 01/31/96
South Dakota State University Brookings, SD 57007 Title: Improvement and Implementation of the Pre-Plant Nitrate-Nitrogen Soil Test	R. Gelderman J. Gerwing	92-34214-8236++	\$ 18,953	09/15/92- 09/30/94
Tennessee Technological University Cookeville, TN 38505 Title: Supercritical Fluid Extraction and Enzyme Immunoassay Analysis of Pesticides	G. Stearman M. Wells R. Cripps	93-34214-8844	\$ 105,000	07/15/93- 07/31/96
University of Tennessee Knoxville, TN 37901-1071 Title: Impacts of Dairy Manure on Surface and Subsurface Water Quality	M. Mullen K. Simmons D. Tyler D. Yoder	93-34214-8848	\$ 149,592	08/01/93- 07/31/96
University of Texas Austin, TX 78713-7726 Title: Integration of Processes and Scales for the MSEA Program	D. Maidment D. McKinney	93-34214-8901	\$ 133,517	08/01/93- 07/31/95

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Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Texas A&M Research Foundation College Station, TX 77843 Title: Diffusion and Sorption of Herbicides in Soil Structural Units	K. McInnes	93-34214-8902	\$ 150,000	08/01/93-07/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Reducing Potential Ground Water Quality Degradation with Herbicide Application Maps	S. Searcy	93-34214-8918	\$ 149,349	08/01/93-07/31/96
Texas A&M Research Foundation College Station, TX 77843 Title: Influence of Redox on Mineralization, Retention and Release of Soil Ammonium	R. Loeppert F. Turner	92-34214-8165++	\$ 27,600	09/15/92-09/30/94
Texas A&M Research Foundation College Station, TX 77843 Title: Plant and Soil N Analysis, Irrigation Technology, Economics and N Use Efficiency	A. Onken E. Segarra W. Lyle	92-34214-8166++	\$ 27,212	09/15/92-09/30/94
Texas A&M Research Foundation College Station, TX 77843 Title: Probabilistic Risk Assessment for Managing Dairy Waste	D. Vietor B. Harris	93-34214-9614	\$ 150,000	09/15/93-09/30/95

++ Continuation Award

Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Utah State University Logan, UT 84322	J. Boettinger L. Dudley P. Kolesar J. Norton	93-34214-8903	\$ 113,646	08/01/93- 07/31/95
Title: Efficiency of Zeolite Use in Reduction of Nitrate Contamination from Animal Manure				
University of Vermont and State Agricultural College Burlington, VT 05405	F. Magdoff R. Durieux W. Jokela	92-34214-8079++	\$ 27,580	09/01/92- 08/31/94
Title: Pre-Sidedress Nitrate Test (PSNT) for First Year Corn Following Sod				
Board of Regents of the University of Wisconsin System Madison, WI 53706	L. Bundy	92-34214-8168++	\$ 25,993	09/15/92 09/30/94
Title: Assessment of Soil Nitrate Tests in Animal-based Farming Systems: Wisconsin				
University of Wisconsin Madison, WI 53706	P. Nowak	92-34214-8167++	\$ 26,749	09/15/92- 09/30/94
Title: Barriers to the Adoption of Improved Nitrogen Tests and Crediting				
Board of Regents of the University of Wisconsin System Madison, WI 53706	P. Nowak F. Madison	93-34214-8904	\$ 96,115	09/01/93- 08/31/96
Title: Effectiveness of Pesticide Regulation: Risk with Atrazine Rate Limitations				

++ Continuation Award

Special Research Grants Program
Water Quality

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 Title: Using Management Practices on Potatoes to Prevent Pesticide Leaching	J. Wyman K. Kung	93-34214-8913	\$ 116,097	08/01/93- 07/31/95

Total : \$ 8,399,880

WOOD UTILIZATION SPECIAL RESEARCH GRANTS PROGRAM

Grants were awarded to support basic studies in areas of wood science and technology that complement the research being conducted at three universities which are currently receiving special grants. Studies in wood machining by laser, wood chemistry, and wood composites are being conducted on eastern hardwoods at Michigan State University. The Oregon State University program is working with western conifers in harvesting timber, wooden structure engineering, wood chemistry, and wood composites. These same areas of research are being studied at Mississippi State University where southern pines are the species of focus. Special emphasis is given to awards dealing with the competitiveness of northern species.

A list of the Wood Utilization Special Research Grants awarded on a competitive basis follow.

Special Research Grants Program
Wood Utilization

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Supervisors Louisiana State University and A&M College Baton Rouge, LA 70803 Title: A Training System for Sawing Northern Hardwood Logs	S. Chang S. Guddanti	93-34158-8933	\$ 96,878	09/15/93- 09/30/95
University of Maine Orono, ME 04469-5715 Title: Improved Utilization of Northeastern Wood Species	B. Cole B. Goodell	93-34158-8632	\$ 616,478	09/01/93- 08/31/95
Michigan State University East Lansing, MI 48824 Title: Hardwoods in Cement-Bonded Particleboard and Wood Fiber Reinforced Cement	P. Soroushian	93-34158-8385	\$ 34,939	07/01/93 06/30/94
Michigan State University East Lansing, MI 48824 Title: Advanced Technology Applications to Eastern Hardwood Utilization	O. Suchsland K. Mukherjee H. Huber	93-34158-8384	\$ 806,901	04/15/93- 04/30/97
MS Agri. & Forestry Expt. Stn. Mississippi State University Mississippi State, MS 39762 Title: Wood Utilization Research	D. Nicholas	93-34158-8349	\$ 897,458	04/01/93- 03/31/97

Special Research Grants Program
Wood Utilization

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7003 Title: Wood Machining and Tooling Research	J. Stewart J. Bailey J. Strenkowski	93-34158-8576	\$ 325,000	07/01/93- 06/30/94
Research Foundation of State University of New York Albany, NY 12201 Title: Prevention of Sticker Stain in Hard Maple	W. Smith	93-34158-8587	\$ 90,000	09/01/93- 08/31/95
Oregon State University Corvallis, OR 97331 Title: Center for Wood Utilization Research	G. Brown	93-34158-8390	\$ 897,458	04/01/93 03/31/97
Pennsylvania State University University Park, PA 16802-1003 Title: Encapsulation and Orientation of Hardwood Fibers in Polyolefin Composites	I. Harrison	93-34158-8577	\$ 100,000	09/01/93- 02/28/95
West Virginia Univ. Res. Corp. West Virginia University Morgantown, WV 26506 Title: A High Speed Non-Destructive Scanner for the Automated Lumber Processing System	P. Klinkhachorn	93-34158-8403	\$ 55,996	07/01/93- 06/30/95

Total : \$ 3,921,108

RANGELAND RESEARCH GRANTS PROGRAM

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RANGELAND RESEARCH

Rangeland Grants are awarded to support research underlying the range management discipline. Grants are awarded in the several research areas deemed to be of high priority by the reviewing panel. Because of the complex nature of the ecosystem classified as range, the research areas are varied. Grants are awarded to examine fundamental relationships of: the riparian ecosystems, range rehabilitation, control of invasive undesirable plants, plant-animal interactions, and range management.

Rangeland Research Grants Program
Rangeland Research Grants

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
USDA, ARS, Pacific West Area Albany, CA 94710 Title: Characterization of Seedbed Microclimate for Burn-Rehabilitation Planning	S. Hardegree F. Pierson C. Hanson	93-38300-8706	\$ 72,572	08/01/93- 07/31/95
Colorado State University Ft. Collins, CO 80523 Title: Cattle Preference as a Tool to Modify Riparian Vegetation	W. Leininger M. Trlica	93-38300-8687	\$ 77,200	09/01/93- 04/30/96
Nebraska Agric. Expt. Station University of Nebraska Lincoln, NE 68583-0704 Title: Influence of Genetic Variation in North American Leafy Spurge on <i>Apthona nigriscutis</i>	S. Nissen R. Masters D. Lee M. Rowe	93-38300-8729	\$ 74,740	07/01/93- 06/30/95
Agricultural Expt. Station Texas A&M University System College Station, TX 77843 Title: Spatial Modeling of Succession in a Subtropical Savanna: An Integrated Approach	D. Loh S. Archer	93-38300-8730	\$ 73,982	07/01/93- 06/30/95
Utah State University Logan, UT 84322 Title: The Importance of Food and Companionship in Choice of Foraging Location by Sheep	F. Provenza	93-38300-8788	\$ 77,200	07/01/93- 06/30/97

Rangeland Research Grants Program
Rangeland Research Grants

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Intermountain Research Station Forest Service, USDA Ogden, UT 84401 Title: Regulation of Seed Germination in Facultatively fall-Emerging Grasses	S. Meyer P. Allen	93-38300-8688	\$ 77,175	07/01/93- 06/30/95

Total : \$ 452,869

**FOOD AND AGRICULTURAL SCIENCES NATIONAL NEEDS
GRADUATE FELLOWSHIPS GRANTS PROGRAM**

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This program was initiated because of increasing concern about growing shortages of trained professionals in the food and agricultural sciences. The objective of the program is to encourage outstanding students (U.S. citizens) to pursue and complete a graduate degree in an area of the food and agricultural sciences for which there is a national need for the development of scientific expertise. The fiscal year 1993 program consisted of grants to colleges and universities with superior graduate teaching and research programs in the targeted areas of the food and agricultural sciences. Fellowships were awarded in the following areas in fiscal year 1993:

<i>Biotechnology--Plant</i>	<i>\$1,134,000</i>
<i>Engineering--Food, Forest,</i>	
<i>Biological, or Agricultural</i>	<i>1,134,000</i>
<i>Water Science</i>	<u><i>1,108,520</i></u>
	<i>\$3,376,520*</i>

*An additional \$18,480 was awarded to the University of Wisconsin to complete the funding of a partial fellowship awarded in FY 1992 in the national need area of human nutrition.

This program is administered under the authority contained in Section 1417(b)(6) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3152). Eligible institutions include all U.S. colleges and universities that confer a graduate degree in an area of the food and agricultural sciences targeted for national needs fellowships.

National Needs Graduate Fellowships Program
Biotechnology, Plant

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011 DOCTORAL: 3	M. Spalding J. Colbert	93-38420-8803	\$ 162,000	09/01/93- 08/31/98
Worcester Polytechnic Institute Worcester, MA 01609 DOCTORAL: 2	P. Weathers	93-38420-8804	\$ 108,000	09/01/93- 08/31/98
Michigan State University East Lansing, MI 48824 DOCTORAL: 2	K. Sink	93-38420-8797	\$ 108,000	09/01/93 08/31/98
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 DOCTORAL: 2	R. Zeyen	93-38420-8800	\$ 108,000	09/01/93- 08/31/98
The Regents of the University of Minnesota Minneapolis, MN 55415 DOCTORAL: 2	B. Gengenbach	93-38420-8799	\$ 108,000	09/01/93- 08/31/98

National Needs Graduate Fellowships Program
Biotechnology, Plant

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina State University Raleigh, NC 27695-7003 DOCTORAL: 2	R. Sederoff	93-38420-8749	\$ 108,000	09/01/93-08/31/98
North Carolina State University Raleigh, NC 27695-7003 DOCTORAL: 2	C. Opperman M. Daub	93-38420-8752	\$ 108,000	09/01/93-08/31/98
Cornell University Ithaca, NY 14853 DOCTORAL: 2	S. Beer O. Yoder	93-38420-8748	\$ 108,000	09/01/93-08/31/98
Oregon State University Corvallis, OR 97331 DOCTORAL: 2	D. Mills D. Arp	93-38420-8753	\$ 108,000	09/01/93-08/31/98
Pennsylvania State University University Park, PA 16802-1003 DOCTORAL: 2	H. Flores J. Shannon	93-38420-8742	\$ 108,000	09/01/93-08/31/98

Total : \$ 1,134,000

National Needs Graduate Fellowships Program
Engineering-Food, Forest, Biological, or Agricultural

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
University of California Davis, CA 95616-8671 DOCTORAL: 2	D. Ryu	93-38420-8805	\$ 108,000	09/01/93- 08/31/98
University of California Davis, CA 95616-8671 DOCTORAL: 2	M. Delwiche	93-38420-8791	\$ 108,000	09/01/93- 08/31/98
University of Florida Gainesville, FL 32611 DOCTORAL: 2	M. Balaban A. Teixeira	93-38420-8795	\$ 108,000	09/01/93- 08/31/98
The Board of Trustees of the University of Illinois Urbana, IL 61801 DOCTORAL: 3	J. Reid R. Pershing	93-38420-8802	\$ 162,000	09/01/93- 08/31/98
University of Nebraska Lincoln, NE 68588-0430 DOCTORAL: 1	L. Bashford G. Meyer	93-38420-8744	\$ 54,000	09/01/93- 08/31/98

National Needs Graduate Fellowships Program
Engineering-Food, Forest, Biological, or Agricultural

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Rutgers, The State University Piscataway, NJ 08855-1089 DOCTORAL: 2	M. Karel M. Solberg	93-38420-8741	\$ 108,000	09/01/93- 08/31/98
Cornell University Ithaca, NY 14853 DOCTORAL: 1	W. Ghiorse T. Steenhuis	93-38420-8743	\$ 54,000	09/01/93- 08/31/98
Cornell University Ithaca, NY 14853 DOCTORAL: 2	S. Capps R. Pitt	93-38420-8750	\$ 108,000	09/01/93 08/31/98
Oregon State University Corvallis, OR 97331 DOCTORAL: 2	R. Leichti J. Morrell	93-38420-8751	\$ 108,000	09/01/93- 08/31/98
Texas A&M University System College Station, TX 77843-2117 DOCTORAL: 1	R. Lacey	93-38420-8754	\$ 54,000	09/01/93- 08/31/98

National Needs Graduate Fellowships Program
Engineering-Food, Forest, Biological, or Agricultural

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 DOCTORAL: 3	S. Gunasekaran R. Hartel	93-38420-8747	\$ 162,000	09/01/93- 08/31/98

Total : \$ 1,134,000

National Needs Graduate Fellowships Program
Water Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of California Davis, CA 95616-8671 DOCTORAL: 2	M. Grismer	93-38420-8792	\$ 108,000	09/01/93- 08/31/98
The Regents of the University of California Riverside, CA 92521 DOCTORAL: 2	W. Jury	93-38420-8793	\$ 108,000	09/01/93- 08/31/98
Colorado State University Ft. Collins, CO 80523 DOCTORAL: 2	J. Loftis	93-38420-8794	\$ 108,000	09/01/93 08/31/98
University of Florida Gainesville, FL 32611 DOCTORAL: 2	P. Rao W. Graham	93-38420-8796	\$ 108,000	09/01/93- 08/31/98
Michigan State University East Lansing, MI 48824 DOCTORAL: 2	F. D'Itri B. Ellis	93-38420-8798	\$ 108,000	09/01/93- 08/31/98

National Needs Graduate Fellowships Program
Water Science

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 DOCTORAL: 2	B. Wilson J. Nieber	93-38420-8801	\$ 108,000	09/01/93- 08/31/98
North Carolina State University Raleigh, NC 27695-7003 DOCTORAL: 2	R. Skaggs J. Gilliam	93-38420-8739	\$ 82,520	09/01/93- 08/31/98
University of Nebraska Lincoln, NE 68588-0430 DOCTORAL: 3	D. Martin B. Volk	93-38420-8740	\$ 162,000	09/01/93 08/31/98
Oklahoma State University Stillwater, OK 74078 DOCTORAL: 2	D. Storm	93-38420-8746	\$ 108,000	09/01/93- 08/31/98
Texas A&M University System College Station, TX 77843-2117 DOCTORAL: 2	C. Munster	93-38420-8745	\$ 108,000	09/01/93- 08/31/98

Total : \$ 1,108,520

National Needs Graduate Fellowships Program
Human Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Board of Regents of the University of Wisconsin System Madison, WI 53706 DOCTORAL: 1	J. Suttie	92-38420-7373	\$ 18,480	09/01/92- 08/31/97

Total : \$ 18,480

** Supplemental award to complete funding of a partial fellowship awarded in FY 1992.

1890 INSTITUTION CAPACITY BUILDING GRANTS PROGRAM

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The objective of this program is to advance the teaching and research capabilities of the 1890 Land-Grant Institutions and Tuskegee University through cooperative initiatives with Federal and non-Federal entities. This program addresses the need to: (1) attract more minority students into the food and agricultural sciences, (2) expand the linkages among the 1890 Institutions and with other colleges and universities, and (3) strengthen the overall capacity of the 1890 Land-Grant Institutions to more firmly establish them as full partners in the food and agricultural science and education system. Teaching projects addressed the following targeted need areas: curricula design and materials development, faculty preparation and enhancement, instructional delivery systems, student experiential learning, scientific instrumentation for teaching, and student recruitment and retention. Research projects addressed high-priority initiatives where there is a present or anticipated need for increased capabilities, such as studies and experimentation in the food and agricultural sciences, the establishment of centralized research support systems, and the development of improved technology delivery systems for producers and consumers. Funds to support research and teaching projects were used as follows:

<i>Research grants</i>	\$4,893,421
<i>Teaching grants</i>	<u>4,971,250</u>
	\$9,864,671

This program is administered under the authority contained in Section 1472(c) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3318). Eligible institutions include the sixteen 1890 Land-Grant Institutions and Tuskegee University.

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Alabama A&M University Normal, AL 35762	S. Saha K. Soliman G. Sharma	93-38814-8887	\$ 184,328	09/01/93- 08/31/96
Title: Application of PCR to Identify DNA Sequences of Biological Importance				
Alabama A&M University Normal, AL 35762	J. Johnson	93-38814-8886	\$ 200,422	09/01/93- 08/31/96
Title: Animal Biotechnology: Cryopreservation Methods on Embryo Development and Viability				
Alabama A&M University Normal, AL 35762	K. Soliman R. Taylor K. Sistani	93-38814-8888	\$ 217,558	09/01/93- 08/31/96
Title: Molecular Basis of Tolerance to Aluminum Toxicity in Soybean (Glycine Max L.)				
Tuskegee University Tuskegee, AL 36088	P. Reddy E. Jenkins S. Wilson	93-38814-8673	\$ 186,782	09/01/93- 08/31/96
Title: Bovine Cytokine Gene Expression and Cell Activation: Stress-induced Alterations				
Tuskegee University Tuskegee, AL 36088	J. Ferguson P. Reddy G. Malone	93-38814-8672	\$ 190,001	09/01/93- 08/31/96
Title: Immunopathological Mechanisms of Caprine Arthritis-Encephalitis Virus				

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Tuskegee University Tuskegee, AL 36088 Title: Molecular Mapping Quantitative Trait Loci for Reproductive Traits in Turkeys	E. Smith	93-38814-8674	\$ 184,096	09/01/93-08/31/96
Delaware State College Dover, DE 19901 Title: Development of Crawfish Culture Methods for Delaware	B. Petrosky	93-38814-8707	\$ 276,098	09/01/93-08/31/96
Florida A&M University Tallahassee, FL 32307 Title: Bioconversion of Grape Residues into Livestock Feed	O. Lamikanra S. Leong M. Abazinge Y. Owusu	93-38814-8708	\$ 297,253	09/15/93-09/30/96
Florida A&M University Tallahassee, FL 32307 Title: Enhancing Methionine Level and Aflatoxin Resistance in Peanut via Biotechnology	M. Sheikh	93-38814-8731	\$ 297,382	09/15/93-09/30/96
Fort Valley State College Fort Valley, GA 31030-3298 Title: Developing Micropropagation and Management Technology for Papaya	U. Yadava	93-38814-8709	\$ 297,500	09/01/93-08/31/96

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Kentucky State University Frankfort, KY 40601 Title: Calcium Metabolism and Bone Structure Impacted by Dieting and Body Weight Change	C. Lee C. Wang	93-38814-8732	\$ 288,769	09/01/93-08/31/96
Kentucky State University Frankfort, KY 40601 Title: Nutritional Requirements and Production Trial of Hybrid Striped Bass in Kentucky	C. Webster	93-38814-8734	\$ 105,320	08/01/93-02/28/96
Kentucky State University Frankfort, KY 40601 Title: Monitoring Exposure and Biomarkers in Limited Resource Farmers to Ag-Chemicals	M. Panemangalore M. Byers	93-38814-8733	\$ 294,551	09/01/93-08/31/96
University of Maryland - Eastern Shore Princess Anne, MD 21853 Title: Enhancing Growth Performance and Carcass Quality in Swine and Broilers	M. Estienne J. Harter-Dennis	93-38814-8710	\$ 254,040	09/01/93-08/31/96
Alcorn State University Lorman, MS 39096 Title: Chinese Melon Production as an Alternative Crop for Small Farmers in the Southern United States	O. Vadhwa R. Idris	93-38814-8711	\$ 176,338	09/15/93-09/30/96

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Alcorn State University Lorman, MS 39096	O. Vadhwa R. Idris L. Huam	93-38814-8712	\$ 152,954	09/15/93- 09/30/96
Title: Low Input Sustainable Production of Southern Blueberries on Erodible Loess Soils				
North Carolina A&T State University Greensboro, NC 27411	W. Amponsah D. McDowell R. Henning	93-38814-8689	\$ 287,280	08/01/93- 07/31/96
Title: Strengthening a Trade Research Program to Enhance Access to International Markets by Small and Minority Agribus.				
Langston University Langston, OK 73050	C. Kleinholz G. Luker	93-38814-8713	\$ 152,954	09/01/93- 08/31/95
Title: Phytoplankton Management Strategies for Channel Catfish Culture Ponds				
Langston University Langston, OK 73050	S. Hart T. Sahlu D. Mowrey	93-38814-8714	\$ 119,087	09/01/93- 08/31/96
Title: Development of Perennial Cool-Season Pasture Systems for the Southern Great Plains				
South Carolina State University Orangeburg, SC 29117	S. Baral	93-38814-8715	\$ 296,301	09/01/93- 08/31/96
Title: Analysis of Agricultural Loan Defaults: Development of Credit/Loan Analysis Models				

1890 Capacity Building Grants Program
1890 Capacity Building Grants - Research

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Prairie View A&M University Prairie View, TX 77446 Title: Decision Support System for Meat Goat Production	J. Dzakuma E. Risch	93-38814-8716	\$ 281,454	09/01/93- 08/31/96
Virginia State University Petersburg, VA 23803 Title: Evaluation of Native "Bradyrhizobium Japonicum" in Virginia Soils	J. Upadhyay	93-38814-8717	\$ 152,953	09/01/93- 08/31/96

Total : \$ 4,893,421

1890 Capacity Building Grants Program
1890 Capacity Building Grants - Teaching

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Alabama A&M University Normal, AL 35762 Title: Infusion of Sustainable Concepts in Agricultural Curricula	C. Reddy	93-38820-8890	\$ 191,250	09/01/93-08/31/96
Alabama A&M University Normal, AL 35762 Title: Strengthening the Agribusiness Programs at Alabama A&M University	H. Jones J. Befecadu G. Wheelock	93-38820-8889	\$ 191,113	09/01/93-08/31/95
Tuskegee University Tuskegee, AL 36088 Title: Computer Assisted Veterinary Medical Education: An Alternative Pathway	T. Habtemariam	93-38820-8676	\$ 198,792	09/01/93-08/31/96
Tuskegee University Tuskegee, AL 36088 Title: A Program for Achievement by Students Trained in Agriculturally Related Studies	M. Maloney A. Ludwick F. Foster	93-38820-8675	\$ 225,000	09/01/93-08/31/96
The Board of Trustees University of Arkansas at Pine Bluff Pine Bluff, AR 71601 Title: Enhancing Library Services in Support of the Degree Program in Regulatory Science	E. Fontenette J. McCray	93-38820-8677	\$ 190,800	09/01/93-08/31/95

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Teaching

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
The Board of Trustees University of Arkansas at Pine Bluff Pine Bluff, AR 71601 Title: Developing a Master of Science Degree Program in Aquaculture	C. Engle	93-38820-8678	\$ 152,680	09/01/93-08/31/95
Delaware State College Dover, DE 19901 Title: A Biotechnology Teaching Laboratory to Enhance Courses in the Plant Sciences	C. Broderick	93-38820-8718	\$ 181,705	09/01/93-08/31/96
Delaware State College Dover, DE 19901 Title: Computer Assisted Instruction in the Agricultural and Natural Resource Sciences	M. Maciarelo	93-38820-8719	\$ 101,866	09/01/93-08/31/96
Florida A&M University Tallahassee, FL 32307 Title: Strengthening of the Master's Degree Program in Agricultural Sciences at Florida A&M University	V. Lamikanra	93-38820-8720	\$ 189,228	09/15/93-09/30/96
Florida A&M University Tallahassee, FL 32307 Title: Enhancement of Agricultural Programs via Satellite and Computer Technologies	Z. Olorunnipa T. Balducci	93-38820-8721	\$ 191,249	09/01/93-08/31/96

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Teaching

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Kentucky State University Frankfort, KY 40601 Title: Developing a Rural Studies and Development Program	A. Seals	93-38820-8735	\$ 189,919	08/01/93-07/31/96
Southern University and A&M College Baton Rouge, LA 70813 Title: Strengthening Agribusiness Instruction and Student Experiential Learning	L. Davis	93-38820-8737	\$ 182,419	08/01/93-07/31/96
Southern University and A&M College Baton Rouge, LA 70813 Title: Pre-College Experience Program for High School Students: BAYOU PHASE VII	W. Rawls	93-38820-8736	\$ 191,181	08/01/93-07/31/96
University of Maryland - Eastern Shore Princess Anne, MD 21853 Title: Recruiting and Developing Academically Talented Minorities for Agricultural Careers	C. Brooks	93-38820-8722	\$ 222,705	09/01/93-08/31/96
University of Maryland - Eastern Shore Princess Anne, MD 21853 Title: Enhancing Performance of Minority/Special Admit Students in Food and AG Sciences	S. Acquah	93-38820-8723	\$ 200,819	09/01/93-08/31/96

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Teaching

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Lincoln University of Missouri Jefferson City, MO 65101	L. Marsh S. Meredith F. Edoho	93-38820-8738	\$ 136,651	09/01/93- 08/31/96
Title: Internationalizing the Undergraduate Experience for Agriculture Students				
Alcorn State University Lorman, MS 39096	L. Huam R. Kumar	93-38820-8724	\$ 225,000	09/15/93- 09/30/96
Title: Enhancing Quantitative Skills of Agricultural Majors				
North Carolina A&T State University Greensboro, NC 27411	L. Powers A. Bell	93-38820-8680	\$ 152,148	09/01/93 08/31/95
Title: Instructional Delivery: The Development of a Multimedia Technology Laboratory				
North Carolina A&T State University Greensboro, NC 27411	G. Reddy C. Raczkowski M. Kamp-Glass	93-38820-8682	\$ 186,775	09/01/93- 08/31/96
Title: Increasing Teaching Capacity of Laboratory Courses in Plant, Soil and Environmental Sciences				
North Carolina A&T State University Greensboro, NC 27411	G. Gayle	93-38820-8681	\$ 191,225	08/01/93- 07/31/96
Title: Upgrading Curriculums of Agricultural Engineering and Landscape Architecture to Include Geographic Information System				

1890 Capacity Building Grants Program
 1890 Capacity Building Grants - Teaching

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
North Carolina A&T State University Greensboro, NC 27411 Title: Strengthening Enrollment Using Shared Resources and Distance Delivery	A. Bell L. Powers	93-38820-8679	\$ 191,250	09/01/93-08/31/95
Langston University Langston, OK 73050 Title: Minorities Graduate School Headstart Program	B. McCoy G. Acquah A. Lewis	93-38820-8683	\$ 146,445	08/01/93-07/31/96
Langston University Langston, OK 73050 Title: Development of Electronic Learning Centers in the 1890 Land-Grant Libraries	A. Mayberry	93-38820-8685	\$ 224,743	08/01/93-12/31/94
Langston University Langston, OK 73050 Title: Computer-Aided Instruction for Food and Agricultural Science Courses	R. Kinnard G. Acquah I. Ro	93-38820-8684	\$ 191,053	08/01/93-07/31/96
Tennessee State University Nashville, TN 37209-1516 Title: A Qualitative and Quantitative Enhancement of Undergraduate Education in Agribusiness	S. Singh	93-38820-8726	\$ 147,946	09/15/93-09/30/96

1890 Capacity Building Grants Program
1890 Capacity Building Grants - Teaching

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Tennessee State University Nashville, TN 37209-1516 Title: Building Human Capital in Foods and Nutrition	G. Johnson S. Godwin	93-38820-8725	\$ 191,206	09/15/93- 09/30/96
Prairie View A&M University Prairie View, TX 77446 Title: Strategies to Attract Minority Students into the Food and Agricultural Sciences	C. Strickland T. Daniels J. Meikle	93-38820-8727	\$ 186,082	09/01/93- 08/31/95

Total : \$ 4,971,250

HIGHER EDUCATION CHALLENGE GRANTS PROGRAM

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The objective of this competitive grants program is to stimulate and enable U.S. colleges and universities to provide the quality of education necessary to produce graduates capable of strengthening the Nation's food and agricultural scientific and professional work force. It is intended that the projects supported by the program will: (1) address a regional, state, national, or international educational need; (2) involve a creative or novel approach toward addressing that need which can serve as a model to others; (3) encourage and facilitate better working relationships in the university science and education community, as well as between universities and the private sector; and (4) result in benefits which will likely transcend project duration and USDA support. In FY 1993, the \$1,455,000 available for this program were used to support baccalaureate-level instruction projects in the following targeted need areas:

Curricula Design and Materials Development
Faculty Preparation and Enhancement for Teaching
Instruction Delivery Systems
Student Experiential Learning

This program is administered under the authority contained in Section 1417(b)(1) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3152). Eligible institutions include land-grant colleges and universities and other U.S. colleges and universities that have a demonstrable capacity to carry out teaching in the food and agricultural sciences.

Challenge Grants Program
Higher Education Challenge Grants Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
California Polytechnic State University San Luis Obispo, CA 93407 Title: Interdisciplinary Team Teaching for Global Agricultural Sustainability	G. Hellyer B. Evans	93-38411-8666	\$ 62,587	09/01/93-08/31/94
Colorado State University Ft. Collins, CO 80523 Title: Graduate Discovery Program for Minorities in Agriculture	P. Roberts J. Heird	93-38411-8783	\$ 64,568	09/01/93-08/31/95
University of Connecticut Storrs, CT 06269-2086 Title: Multimedia Backgrounder Computer Aided Instruction Modules in Improving Teaching	J. Riesen M. Darre E. Mills M. Lawton	93-38411-8641	\$ 48,278	09/01/93-08/31/96
Florida State University Tallahassee, FL 32306 Title: Mentoring Minority Students for the Food and Agricultural Sciences: A Cooperative Program	P. Ralston V. Lamikanra	93-38411-8667	\$ 68,000	09/01/93-08/31/95
Iowa State University of Science and Technology Ames, IA 50011 Title: Multimedia Workshops: Digital Capture and Courseware Authoring and Presentation	D. Adams D. Graf	93-38411-8636	\$ 78,865	09/01/93-08/31/95

Challenge Grants Program
Higher Education Challenge Grants Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Iowa State University of Science and Technology Ames, IA 50011 Title: Model Ethics Institute	G. Comstock	93-38411-8638	\$ 51,135	09/01/93-08/31/95
The Board of Trustees of the University of Illinois Urbana, IL 61801 Title: Providing a Foundation for Agribusiness Management Education	M. Mazzocco S. Sonka F. Winter	93-38411-8663	\$ 71,950	09/01/93-08/31/95
Purdue University West Lafayette, IN 47907 Title: Course Development: Engineering Properties of Biological Materials	R. Stroshine	93-38411-8637	\$ 67,457	09/01/93-08/31/95
Purdue University West Lafayette, IN 47907 Title: Food Processing Management Computer Simulation	S. Erickson J. Marks	93-38411-8635	\$ 62,543	09/01/93-08/31/95
University of Kentucky Research Foundation Lexington, KY 40506-0057 Title: Faculty and Curricular Enhancement to Support Internships in China and France	M. Reed H. Massey	93-38411-8640	\$ 64,475	09/01/93-08/31/95

Challenge Grants Program
Higher Education Challenge Grants Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Louisiana Tech University Ruston, LA 71272 Title: Satellite Assisted Training for Family Directed Infant/Toddler Early Intervention	B. Garner	93-38411-8668	\$ 44,279	09/01/93-08/31/95
Michigan State University East Lansing, MI 48824 Title: Decision Case Use in Agricultural Sciences: Researching, Writing, and Teaching	E. Foster A. Skidmore O. Hesterman H. Peterson	93-38411-8664	\$ 71,472	09/01/93-03/31/95
The Regents of the University of Minnesota Minneapolis, MN 55415-1226 Title: Integrated Natural Resources Planning	D. Rose T. Burk G. Furnier	93-38411-8665	\$ 65,803	09/01/93-08/31/96
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: International Student Agribusiness Resources (STARS)	I. Gonzalez R. Skaggs	93-38411-8643	\$ 66,233	09/01/93-08/31/95
Board of Regents of New Mexico State University Las Cruces, NM 88003 Title: A Systems Approach for Internationalizing Undergraduate Agricultural Curricula	H. Matteson I. Gonzalez P. Huntsberger	93-38411-8642	\$ 63,767	09/01/93-08/31/95

Challenge Grants Program
Higher Education Challenge Grants Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cornell University Ithaca, NY 14853 Title: A Dynamic, Interactive, Electronic Textbook in Plant Pathology	P. Arneson	93-38411-8639	\$ 45,527	09/01/93- 08/31/95
Oregon State University Corvallis, OR 97331 Title: Integrated Product, Process and Package Development (I3PD) in the Food Industry	J. Torres D. Farkas	93-38411-8656	\$ 65,000	09/01/93- 08/31/95
Oregon State University Corvallis, OR 97331 Title: Co-Learning: An Education Model in Agroforestry	M. Roush R. William S. Sharrow D. Hibbs	93-38411-8657	\$ 65,000	09/01/93- 08/31/95
Agricultural Expt. Station Texas A&M University System College Station, TX 77843 Title: Theoretical Bases for Systemic Change in Higher Education in Agriculture	H. Kunkel	93-38411-8658	\$ 64,568	09/01/93- 08/31/94
Texas Tech University Lubbock, TX 79409-1035 Title: Enhancing the Agricultural Communications Curriculum	H. Terry P. Vaughn	93-38411-8659	\$ 66,825	09/01/93- 08/31/94

Challenge Grants Program
Higher Education Challenge Grants Program

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Utah State University Logan, UT 84322 Title: Development of an International Agribusiness Internship Center	W. Sleight	93-38411-8646	\$ 67,985	09/01/93- 08/31/95
Virginia Polytechnic Institute & State University Blacksburg, VA 24061 Title: Valuing Diversity: Faculty and Student Activities to Enhance Education	V. Wall M. Norton	93-38411-8644	\$ 64,568	09/01/93- 08/31/96
Virginia Polytechnic Institute and State University Blacksburg, VA 24061-0249 Title: Computer-Based Multimedia Instruction for Woody Plant Identification	J. Seiler C. Taylor	93-38411-8645	\$ 64,115	09/01/93- 08/31/95

Total : \$ 1,455,000

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

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The objectives of this program are to stimulate technological innovation in the private sector, to strengthen the role of small business in meeting Federal research and development needs, to increase private sector commercialization and development efforts, and to encourage participation of small and disadvantaged firms in technological innovation.

The program emphasizes support of high quality research and development proposals containing advanced concepts related to important agricultural problems and opportunities that could lead to significant public benefits. The areas considered in this program are broad and encompass a wide range of agricultural sciences. The subtopics include: (1) forests and related resources, (2) plant production and protection, (3) animal production and protection (4) air, water, and soils, (5) food science and nutrition, (6) rural and community development, (7) aquaculture, and (8) industrial applications.

In Fiscal Year 1993, USDA awarded both Phase I and Phase II grants. Phase I grants are primarily for research designed to determine technical feasibility of the proposed approach or concept. Phase II grants are awarded to those Phase I projects that have shown sufficient promise for further support. The total amount awarded in Fiscal Year 1993 was \$7,016,760.

Small Business Innovation Research Program
Forests & Related Resources

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Noble Franklin Corporation 5963 La Place Court, Suite 207 Carlsbad, CA 92008 Title: Replacing Pulpwood and Solid Wood Residues with Waste Paper Veneer and Fiberboard Panels	B. Bryant	93-33610-8593	\$ 50,000	05/15/93- 01/31/94
KDC Technology Corp. 2011 Research Drive Livermore, CA 94550 Title: Cure Monitoring of Plywood and Composite Wood Products	R. King	93-33610-8589	\$ 50,000	05/15/93- 11/30/93
Membrane Technology and Research, Inc. 1360 Willow Rd., Suite 103 Menlo Park, CA 94025 Title: Recovery of Organic Feedstocks from Kraft Process Streams by Pervaporation	R. Baker	93-33610-8590	\$ 39,159	05/15/93- 01/31/94
Engineering Data Management, Inc. 4700 McMurray Avenue Fort Collins, CO 80525 Title: In-Situ Strength Evaluation of Thermally Degraded Fire-Retardant-Treated Plywood	R. Anthony	93-33610-9093	\$ 125,000	09/15/93- 09/30/95
Olson Engineering, Inc. 14818 W. 6th Ave., Unit 5A Golden, CO 80401 Title: Stress Wave Scanning for In-Place Structural Integrity of Wood Components	L. Olson	93-33610-8616	\$ 50,000	05/15/93- 11/30/94

Small Business Innovation Research Program
Forests & Related Resources

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Genesis Research 631 Sylvan Court Batavia, IL 60510 Title: A High-Efficiency Radio-Frequency Vacuum Dryer	T. Owens	93-33610-8591	\$ 50,000	05/15/93- 11/30/93
ISI Group, Inc. 211 Conchas Ave. SE Albuquerque, NM 87123 Title: Using Remote Pyroelectric Video Imagery for Gravel Detection	J. Cline	93-33610-8499	\$ 50,000	05/15/93- 11/30/93
Peninsu-Lab 5795 N.E. Minder Road Poulsbo, WA 98370 Title: Biocontrol of Botrytis cinerea on Greenhouse Grown Conifer Seedlings	F. McElroy	93-33610-9055**	\$ 220,000	09/01/93- 08/31/95

Total : \$ 634,159

** Split Funded Award

Small Business Innovation Research Program
Plant Production & Protection

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
B. W. Jordan & Company, Inc. 6861 Kenanna Place Tucson, AZ 85704 Title: An Instrument for Real Time Measurement of Agricultural Spray Deposition and Drift	B. Jordan	93-33610-9589**	\$ 200,000	09/15/93-09/30/95
Biotactics, Inc. 22412 Pico St. Grand Terrace, CA 92324 Title: Biological Control of Lygus Bug with Augmentative Releases of Anaphes iole	G. Scriven	93-33610-8456	\$ 49,204	05/15/93-11/30/93
DNA Plant Technologies, Inc. 6701 San Pablo Avenue Oakland, CA 94608 Title: Freeze-Tolerant Deletion and Insertion Mutations in Arabidopsis thaliana	G. Warren	93-33610-8447	\$ 50,000	05/15/93-01/31/94
biosys 1057 East Meadow Circle Palo Alto, CA 94303 Title: In Vitro Mass Production of Baculovirus Insecticides	J. White	93-33610-8465	\$ 50,000	05/15/93-11/30/93
ImmunoPharmaceutics, Inc. 11011 Via Frontera San Diego, CA 92127 Title: Design of an Insecticidal Ecdysone Receptor Antagonist	E. Skaletsky	93-33610-8463	\$ 50,000	05/15/93-11/30/94

** Split Funded Award

Small Business Innovation Research Program
Plant Production & Protection

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Chestnut Hill Nursery, Inc. Route 1, Box 341 Alachua, FL 32615 Title: Chestnut Industry Development Through New Clonal Propagation Techniques	R. Wallace	93-33610-8466	\$ 50,000	05/15/93- 11/30/94
G and K Enterprises RR1 Box 83A Princeton, ID 83857 Title: Technical and Economic Feasibility of Mechanized Gathering of Baled Hay from Northern Idaho Hillside	G. Morris	93-33610-8619	\$ 34,921	05/15/93- 11/30/93
Horizon Technology Group, Inc. 5513 Roosevelt St. Bethesda, MD 20814 Title: Automated Acoustic Inspection of Insects in Stored Grain	R. McIntosh	93-33610-8620	\$ 49,976	05/15/93- 11/30/93
Field Control Systems, Inc. 2276 5th Street White Bear Lake, MN 55110 Title: Video Mapping for Near-Real-Time Field Management	L. Hanson	93-33610-8611	\$ 50,000	05/15/93- 11/30/93
Natural Fibers Corporation P.O. Box 830 Ogallala, NE 69153 Title: Disease Control in Milkweed Species and Ecotype Selection	M. Boosalis	93-33610-9260**	\$ 220,000	09/15/93- 09/30/95

** Split Funded Award

Small Business Innovation Research Program
Plant Production & Protection

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Sanford Scientific, Inc. 877 Marshall Road Waterloo, NY 13165 Title: Biolistic Transformation of Flowers: Transgene-Mediated Disease Resistance	A. Blowers J. Sanford	93-33610-8480	\$ 50,000	05/15/93- 11/30/93
Ag Systems, Inc. 1515 Elm Hill Pike, Ste. 309 Nashville, TN 37210 Title: Precision, Flow Independent Fluid Metering of Agrichemicals	J. Hunter	93-33610-8494	\$ 50,000	05/15/93- 11/30/93
NPS Pharmaceuticals, Inc. 420 Chipeta Way, Suite 240 Salt Lake City, UT 84108 Title: Parasitic Wasp Toxins as Tools in the Discovery of Improved Insecticides	F. Fuller	93-33610-9263**	\$ 240,000	09/01/93- 08/31/95
Small Potatoes, Inc. 1202 Ann Street Madison, WI 53713 Title: Optimization and Mechanization of Microtuber Production	P. Joyce	93-33610-9264**	\$ 225,000	09/01/93- 08/31/95

Total : \$ 1,369,101

** Split Funded Award

Small Business Innovation Research Program
Animal Production & Protection

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Arizona Biotechnology Corporation 1430 E. Fort Lowell Rd., 200 Tucson, AZ 85719-2366 Title: Detecting Serpulina hyodysenteriae-Specific DNA by chemiluminescence	M. Mapother	93-33610-8446**	\$ 49,820	05/15/93- 11/30/93
DDx, Incorporated 2555 55th St. D104 Boulder, CO 80301 Title: An Ellipsometric Assay for Quantifying Penicillin Residues in Milk	H. Hanlin	93-33610-8490**	\$ 49,883	05/15/93- 01/31/94
Genra Systems, Inc. 3905 Annapolis Lane Minneapolis, MN 55447 Title: Developing a Chicken MHC Typing Test Using DNA Amplification and Oligonucleotide Probes	R. Shuman E. Heath	93-33610-9261**	\$ 210,000	09/15/93- 09/30/95
Andcare, Inc. 2810 Meridian Parkway, Ste 152 Durham, NC 27713 Title: Electro-Immunesensor to Detect Agricultural Chemical Residues in Food Products	J. O'Daly	93-33610-9605	\$ 10,000	09/01/93- 09/30/94
Eastern Artificial Insemination Cooperative, Inc. P.O. Box 5518 Ithaca, NY 14852-5518 Title: Growth Hormone Response as an Indicator of Genetic Merit in Dairy Sires	B. Bean	93-33610-8492	\$ 48,644	05/15/93- 11/30/93

** Split Funded Award

Small Business Innovation Research Program
Animal Production & Protection

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
BioPore, Inc. P.O. Box 482 Centre Hall, PA 16828 Title: Storage of Turkey Sperm in Unique Environmental Chambers	E. Buss	93-33610-9262**	\$ 200,000	09/15/93-09/30/95
Lynntech, Inc. 7610 Eastmark Drive, Suite 105 College Station, TX 77840 Title: A New Disinfection Technique for Commercial Poultry Facilities	G. Hitchens	93-33610-8460**	\$ 50,000	05/15/93-11/30/93
Detectnology, Inc. P.O. Box 487 Pullman, WA 99163 Title: Continuous Electronic Surveillance for Detection of Estrus in Dairy Cattle	P. Senger	93-33610-9056**	\$ 220,000	09/15/93-03/31/95
Genetic Visions, Inc. 2800 S. Fish Hatchery Rd. Madison, WI 53711 Title: Direct Determination of Dairy Cattle's Genetic Merit	C. Cowan	93-33610-8485**	\$ 50,000	05/15/93-01/31/94

Total : \$ 888,347

** Split Funded Award

Small Business Innovation Research Program
Air, Water, & Soils

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
B. W. Jordan & Company, Inc. 6861 Kenanna Place Tucson, AZ 85704 Title: A Portable Instrument for Real Time Detection of Airborne Particulates	B. Jordan	93-33610-8612	\$ 49,734	05/15/93- 11/30/93
EMC/Hirsch, Inc. 11811 Major Street Culver City, CA 90230 Title: Water Conservation Using Evapotranspiration Broadcast and Dynamic Control	M. Hirsch	93-33610-8614	\$ 49,932	05/15/93- 11/30/94
Yankee Environmental Systems, Inc. 101 Industrial Rd/POB 746 Turners Falls, MA 01376 Title: Low Cost Ultraviolet Spectral Instrumentation	B. Dichter	93-33610-9094**	\$ 215,000	09/15/93- 09/30/95
NeoMecs, Inc. 4832 Park Glen Rd. St. Louis Park, MN 55416 Title: Development of Novel Plasma Membrane Intrinsic to Improved Water Sensor	H. Nomura	93-33610-8622	\$ 50,000	05/15/93- 11/30/93
Daniel B. Stephens & Associates, Inc. 6020 Academy NE, Suite 100 Albuquerque, NM 87109 Title: Rapid Field Permeameter of Hydraulic Conductivity of Unsaturated Soil	D. Stephens	93-33610-9050	\$ 177,935	09/15/93- 09/30/95

** Split Funded Award

Small Business Innovation Research Program
Air, Water, & Soils

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
OLTech Corporation 11795 Sherwood Trail Chesterland, OH 44026-1730 Title: Sensitivity Analysis of Groundwater Flows	O. Lafe	93-33610-8459	\$ 50,000	05/15/93- 11/30/93
Atom Sciences, Inc. 114 Ridgeway Center Oak Ridge, TN 37830 Title: UV-B Detector Based Upon Rydberg States	T. Whitaker	93-33610-8483	\$ 49,981	05/15/93- 11/30/93

Total : \$ 642,582

Small Business Innovation Research Program
Food Science & Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Cole Engineering 332 N. Ridge Rd. Little Rock, AR 72207 Title: An On-Line Waveguide Refractometer for the Edible Oil Hydrogenation Process	C. Cole	93-33610-8613	\$ 49,655	05/15/93-11/30/93
Landec Corporation 3603 Haven Avenue Menlo Park, CA 94025 Title: Temperature Abuse Compensating Films for Modified Atmosphere Food Packaging	R. Stewart	93-33610-9092	\$ 230,000	09/15/93-09/30/95
Astleford, Inc. 5932 Hugh Howell Rd. Stone Mountain, GA 30087-2401 Title: High-Speed Laser-Based Fruit and Vegetable Maturity Measuring System	J. Astleford	93-33610-8584	\$ 45,775	05/15/93-01/31/94
Omega International Technology, Inc. 460 Wegner Rd. Lakemoor, IL 60050-8653 Title: Foreign Material Detection System for Food Items	N. Gupta	93-33610-8592	\$ 47,812	05/15/93-11/30/93
Benthos, Inc. 49 Edgerton Dr. N. Falmouth, MA 02556-2826 Title: Non-Radiation Based Container Fill Height Measuring Device	F. Raspante C. Woringer	93-33610-8467	\$ 49,788	05/15/93-11/30/93

Small Business Innovation Research Program
Food Science & Nutrition

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Neogen Corporation, Inc. 620 Leshar Place Lansing, MI 48912-1509 Title: Monoclonal Antibodies for an ELISA for the Ethylene-Related Protein PApER-1	D. Dixon-Holland	93-33610-8479	\$ 49,600	05/15/93-05/31/94
Neogen Corporation, Inc. 620 Leshar Place Lansing, MI 48912-1509 Title: A Time-Temperature History Sensor	B. Torgerson	93-33610-9465**	\$ 200,000	09/15/93-09/30/95
Chemica Technologies 1011 N.W. Division St. Bend, OR 97701-4566 Title: Novel Process Technology for Utilization of Fruit and Vegetable Waste	D. Brose	93-33610-8481	\$ 50,000	05/15/93-11/30/93
Suprex Corporation 125 William Pitt Way Pittsburg, PA 15238 Title: The Preparation of Agricultural Products by Supercritical Fluid Extraction	J. Levy	93-33610-8493	\$ 50,000	05/15/93-11/30/93
Lynntech, Inc. 7610 Eastmark Drive, Suite 105 College Station, TX 77840 Title: A Flow System for Electrochemical Monitoring of Bioprocess Microbial Activity	G. Hitchens	93-33610-9258	\$ 210,000	09/15/93-09/30/95

** Split Funded Award

Total : \$ 982,630

Small Business Innovation Research Program
Rural & Community Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Florida Specialty Research, Inc. 10560 Tram Rd. Tallahassee, FL 32311 Title: An Integrated System for Meat Rabbit Production and Processing	J. Hawk	93-33610-8597	\$ 49,920	08/15/93-02/28/94
Kona Cinder and Soil 74-5518 Kaiwi St., Ste. 201 Kailua-Kona, HI 96740 Title: Recycling Green Wastes in Hawaii	C. Harlan	93-33610-8585	\$ 49,449	05/15/93-11/30/93
Glenn H. Woods Corporation 148 Logtown Rd. Amherst, MA 01002 Title: Adult Foster Care: A Revenue-Generating Opportunity for Rural Communities	E. Fetterman	93-33610-8478	\$ 50,000	05/15/93-11/30/93
Signatron Technology Corporation 110 Hartwell Avenue Lexington, MA 02173-3198 Title: Over-the-Horizon Data/Video Links for Rural Areas	S. Parl	93-33610-9637	\$ 49,406	09/15/93-03/31/94
TeleSonic, A Division of Associated Enterprises, Inc. 120 Admiral Cochrane Dr. Annapolis, MD 21401 Title: Telephone Technology and Rural Tourism Development: Romancing the Metro Tourist	L. Blackshear	93-33610-8586	\$ 49,996	05/15/93-11/30/93

Small Business Innovation Research Program
Rural & Community Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
<p>MetaDynamics, Inc. 11 South 4th St., Suite 210 Grand Forks, ND 58201 Title: Enterprise Homesteading for Rural Development</p>	D. Zimmerman	93-33610-9054	\$ 210,000	09/15/93-03/31/95
<p>Straw-Bale Construction Management, Inc. 939 Acequia Madre Sante Fe, NM 87505 Title: The Use of Straw Bales for Building Low Income Housing</p>	A. Perry	93-33610-9051	\$ 230,000	09/01/93-08/31/95
<p>Drake Environmental Consultants 7 Michigan Street, Box 155 East Bloomfield, NY 14443-0155 Title: Expert System Shell, Multipurpose Land Information Systems for Rural Government</p>	B. Drake	93-33610-9052	\$ 200,000	09/15/93-09/30/95
<p>Hollow Road Farms, Inc. RR1, Box 93 Stuyvesant, NY 12173 Title: Sheep Dairying: An Employment and Revenue Generating Opportunity for Rural Areas</p>	J. Snyder	93-33610-9053	\$ 180,000	09/15/93-09/30/95
<p>Ley & Company, Inc. P.O. Box 308 Wexford, PA 15090 Title: Film Location Marketing: Multimedia Imaging System, Inventory Management of Rural Location Assets</p>	C. Johnson	93-33610-8482	\$ 50,000	05/15/93-11/30/93

Small Business Innovation Research Program
Rural & Community Development

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
El Aficionado, Ltd. 2365 N. Quincy St. Arlington, VA 22207 Title: Maize Mushroom Production: The Development of Common Corn Smut as a Cash Crop	C. Arnold	93-33610-8484	\$ 50,000	05/15/93- 11/30/93

Total : \$ 1,168,771

Small Business Innovation Research Program
Aquaculture

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
<p>STO Design Group, Inc. 1921 E. Carnegie Ave. Ste. 3-E Santa Ana, CA 92705 Title: A New, Modular Impellor for Aquaculture Paddlewheel Aerators</p>	D. Stevens	93-33610-8477	\$ 50,000	05/15/93-11/30/93
<p>Neushul Mariculture Incorporated 475 Kellogg Way Goleta, CA 93117 Title: Broadcast Seeding Methods for Macroalgal Mariculture</p>	J. Benson	93-33610-8615	\$ 49,999	05/15/93-11/30/93
<p>Royal Hawaiian Sea Farms, Inc. P. O. Box 3167 Kailua-Kona, HI 96745 Title: Development of Hatchery Techniques for the Edible Hawaiian Limpet <i>Cellana sandwicensis</i></p>	D. Sarver	93-33610-8617	\$ 50,000	05/15/93-11/30/94
<p>Royal Hawaiian Sea Farms, Inc. P. O. Box 3167 Kailua-Kona, HI 96745 Title: Development of Aquaculture Techniques for Two Species of Edible Sea Cucumbers in Hawaii</p>	D. Sarver	93-33610-9259	\$ 200,000	09/15/93-09/30/95
<p>Hawaii Fish Company P.O. Box 1039 Waialua, HI 96791-1039 Title: Evaluation of Controlled Spawning Techniques and Artificial Diets for the Striped Snakehead <i>Channa striatus</i></p>	R. Weidenbach	93-33610-8618	\$ 47,295	05/15/93-11/30/93

Small Business Innovation Research Program
Aquaculture

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
AquaPharm Technologies Corporation 17 Williams St. Brookline, MA 02146 Title: Technology for Efficient Administration of Pharmaceuticals into Populations of Farmed Fish	A. Goren	93-33610-8621	\$ 50,000	05/15/93-11/30/93
KTAADN, INC. 1340 Centre St., Suite 202 Newton, MA 02159 Title: Innovative Predictor for Off-Flavors in Catfish	D. Frankel	93-33610-8491	\$ 48,268	05/15/93-11/30/93
Jensorter, Inc. 20225 Harvest Lane Bend, OR 97701 Title: Counting Trout and Salmon Fry	G. Jensen	93-33610-9257	\$ 60,000	09/15/93-09/30/95
Zeigler Brothers, Inc. P.O. Box 95 Gardners, PA 17324 Title: Kelp Like Feed Product for Abalone	D. Villamar	93-33610-8500	\$ 49,958	05/15/93-11/30/93
American Research Corporation of Virginia P.O. Box 3406 Radford, VA 24143-3406 Title: Self-Assembled Thin Film Sensors for Aquaculture Process Control	R. Churchill	93-33610-9096	\$ 220,000	09/15/93-09/30/95

Small Business Innovation Research Program
Industrial Applications

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
International Flora Technologies, Ltd. 2267 S. Coconino Drive Apache Junction, AZ 85220 Title: Development of Cosmetic Grade Oil and Derivatives from Vernonia galamensis Seed	J. Arquette	93-33610-8476**	\$ 50,000	05/15/93-11/30/93
Microsome P.O. Box 155 Sunnyvale, CA 94089 Title: Commercial Use of Cellulose Microbubbles as an Alternative to Polystyrene Foam	E. Tickner	93-33610-8457**	\$ 50,000	05/15/93-11/30/93
Cape Cod Research, Inc. 19 Research Rd. East Falmouth, MA 02536 Title: An Agriculturally Based, Non-Toxic Antifouling Paint	B. Dixon	93-33610-8458	\$ 50,000	05/15/93-11/30/93
Ceramem Corporation 12 Clematis Avenue Waltham, MA 02154 Title: Nonfouling Ceramic Membranes for Treatment of Fuel Ethanol Stillage	R. Goldsmith	93-33610-9095	\$ 220,000	09/15/93-09/30/95
Universal Fuel Development Associates, Inc. 223 Circle Hills Dr. Grand Forks, ND 58201 Title: Oxygenate Synthesis from Agricultural Materials	E. Olson	93-33610-8449**	\$ 50,000	05/15/93-01/31/94

** Split Funded Award

Small Business Innovation Research Program
Industrial Applications

ORGANIZATION	PRINCIPAL INVESTIGATORS	GRANT NUMBER	AMOUNT	AGREEMENT PERIOD
Digestive Care, Inc. 75 Bissell Rd. Bethlehem, PA 18015 Title: Collection of Bile Juices from Turkey Gallbladders	T. Sipos	93-33610-8453**	\$ 48,650	05/15/93- 11/30/93
AGRECOL Corporation 4906 Femrite Drive Madison, WI 53716 Title: Utilization of Kenaf Mulch-Mat for Erosion Control and for the Establishment of Native Plants on Roadsides	P. Porter	93-33610-8486**	\$ 47,000	05/15/93- 05/31/94

Total : \$ 515,650

** Split Funded Award

SCIENTISTS WHO SERVED ON USDA/CSRS PEER REVIEW PANELS FOR FISCAL YEAR 1993

Scientists from academic institutions, government, industry and private organizations served on USDA/CSRS peer review panels this past year. Each panel was assembled to fit the expertise needed for a specific granting area. The scientists involved are listed below.

The following individuals served as peer review panel members for programs of the **National Research Initiative Competitive Grants Program**:

Michael	W. W.	Adams	University of Georgia
Michael	J.	Adang	University of Georgia
Richard		Amasino	University of Wisconsin
David	B.	Anderson	Lilly Research Laboratories
Peter	D.	Ascher	University of Minnesota
Charles		Bacon	USDA, Agricultural Research Service
Edward	B.	Bagley	USDA, Agricultural Research Service
Cynthia		Baldwin	Ohio State University
Pedro		Barbosa	University of Maryland
Susan	F.	Barefoot	Clemson University
Andrzej		Bartke	Southern Illinois School of Medicine
Craig	W.	Beattie	USDA, Agricultural Research Service
Nancy	E.	Beckage	University of California
Patricia	A.	Bedinger	University of North Carolina
Richard	W.	Beeman	USDA, Agricultural Research Service
Faith	C.	Belanger	Rutgers University
Eugene	S.	Berry	North Dakota State University
Sandra	L.	Berry-Lowe	University of Colorado
Nancy	M.	Betts	University of Nebraska
Louis	B.	Bjostad	Colorado State University
John	M.	Blair	Kansas State University
Shirley	R.	Blakely	Food & Drug Administration
Leroy	L.	Blakeslee	Washington State University
Hans	P.	Blaschek	University of Illinois
Frank		Blecha	Kansas State University
Elizabeth		Blood	University of South Carolina
Timothy		Boosinger	Auburn University
Richard	M.	Bostock	University of California
Rodney	J.	Bothast	USDA, Agricultural Research Service
M. Deane		Bowers	University of Colorado
James	Y.	Bradfield IV	Texas A&M University
Harvey	D.	Bradshaw, Jr.	University of Washington
Caroline		Breitenberger	Ohio State University
Ray	A.	Bressan	Purdue University
David		Brian	University of Tennessee
David	E.	Briles	University of Alabama
Charlotte		Bronson	Iowa State University

Gerald	M.	Buening	University of Missouri
V. Kelly		Bunning	U. S. Food & Drug Administration
Joan		Burnside	University of Delaware
Thomas	J.	Burr	Cornell University
Daniel	R.	Bush	USDA, Agricultural Research Service
Susan		Carpenter	Iowa State University
Nicholas	C.	Carpita	Purdue University
Donald	K.	Cassell	North Carolina State University
Lucy		Cherbas	Indiana University
Manjeet	S.	Chinnan	University of Georgia
Kenneth	D.	Clinkenbeard	Oklahoma State University
John	M.	Connor	Purdue University
Annabel	K.	Cook	Washington State University
Daniel		Cosgrove	Pennsylvania State University
Kim	E.	Creek	University of South Carolina
Kermit		Cromack, Jr.	Oregon State University
Brian	A.	Crooker	University of Minnesota
David	E.	Crowley	University of California
Susan	L.	Cuppett	University of Nebraska
Charles	J.	Czuprynski	University of Wisconsin
Anath		Das	University of Minnesota
George	C.	Davis	University of Tennessee
William	R.	Dayton	University of Minnesota
Adela		de la Torre	California State University
Dennis	R.	Dean	Virginia Polytechnic Institute and State University
Anne	E.	Desjardins	USDA, Agricultural Research Service
Charles	W.	Deyoe	Kansas State University
Bruce	A.	Diner	E.I. duPont de Nemours Company
Larry	J.	Douglas	Entropy Associates, Inc.
Robert	H.	Dowdy	University of Minnesota
Myron	O.	Downs	University of Georgia
Stephen	O.	Duke	USDA, Agricultural Research Service
Peter	E.	Dunn	Purdue University
Pamela		Dunsmuir	DNA Plant Technology
William	E.	Dyer	Montana State University
Joan	G.	Ehrenfeld	Rutgers University
Hollis	N.	Erb	Cornell University
Lewis	J.	Feldman	University of California
Gary	W.	Felton	University of Arkansas
Robert	J.	Ferl	University of Florida
Allison	R.	Ficht	Texas A&M University
Ruth		Finkelstein	University of California
Alanah		Fitch	Loyola University of Chicago
James	R.	Florini	Syracuse University
Irwin	N.	Forseth, Jr.	University of Maryland
James	H.	Fownes	University of Hawaii

Joseph	F.	Frank	University of Georgia
Harry	A.	Frank	University of Connecticut
Malcolm	J.	Fraser	University of Notre Dame
John	A.	Freeman	University of Southern Alabama
Alexander	L.	Friend	Mississippi State University
Robert	S.	Fritz	Vassar College
Susan		Froshauer	Pfizer, Inc.
Philip		Garcia	University of Illinois
Duane	L.	Garner	University of Nevada, Reno
Louis	C.	Gasbarre	USDA, Agricultural Research Service
Rodney	D.	Geisert	Oklahoma State University
Stanton		Gelvin	Purdue University
Jadwiga	M.	Giebultowicz	USDA, Agricultural Research Service
Bonita		Glatz	Iowa State University
Terrence	F.	Glover	Utah State University
Arthur	J.	Gold	University of Rhode Island
Ellen		Goldberg	University of New Mexico
David	E.	Gombas	Kraft General Foods
Frank	M.	Goode	Pennsylvania State University
Thomas	R.	Gordon	University of California
Tom		Gower	University of Wisconsin
Dee	M.	Graham	
Robin	L.	Graham	Oak Ridge National Laboratory
David	A.	Grantz	University of California
Hans	E.	Grethlein	Michigan Biotechnology Institute
David	F.	Grigal	University of Minnesota
Howard	D.	Grimes	Washington State University
Christina		Gringeri	University of Utah
Peter		Groffman	Institute of Ecosystems Studies
Karel		Grohmann	USDA, Agricultural Research Service
James		Groth	University of Minnesota
Marvin	J.	Grubman	USDA, Agricultural Research Service
J. Perry		Gustafson	USDA, Agricultural Research Service
Perry		Hackett	University of Minnesota
Ann	E.	Hajek	Boyce Thompson Institute
Brian	D.	Halligan	Medical College of Wisconsin
Earl	G.	Hammond	Iowa State University
James	M.	Hammond	Milton S. Hershey Medical Center
Jo		Handelsman	University of Wisconsin
Roger	P.	Hangarter	Ohio State University
Peter	J.	Hansen	University of Florida
Sidney	S.	Harper	National Fertilizer & Environmental Research Center
Ruth	B.S.	Harris	Kraft General Food Inc.
Rosalind	P.	Harris	University of Kentucky
Frederick	C.	Hartman	University of Tennessee
Dermot	J.	Hayes	Iowa State University

Jane	L.	Hayes	USDA, Forest Service
Terry	C.	Hazen	Westinghouse Savannah River Co.
Jerry	L.	Hedrick	University of California
Gray	S.	Henderson	U. S. Environmental Protection Agency
Mark	S.	Henry	Clemson University
Hildegarde		Heymann	University of Missouri
Stephen	H.	Howell	Boyce Thompson Institute
Casey	W.	Hoy	Ohio State University
Karen	W.	Hughes	University of Tennessee
Scot	H.	Hulbert	Kansas State University
John	J.	Iandolo	Kansas State University
William	P.	Inskeep	Montana State University
Andrew	O.	Jackson	University of California
Thomas	W.	Jacobs	University of Illinois
Jay	S.	Jacobson	Boyce Thompson Institute
Wesley	M.	Jarrell	Oregon Graduate Institution
James	M.	Jay	Wayne State University
Lynn		Joens	University of Arizona
Patricia	A.	Johnson	Cornell University
Alan	L.	Johnson	Rutgers University
Alan	M.	Jones	University of North Carolina
Clinton		Jones	University of Nebraska
Robert	J.	Jones	University of Minnesota
Joseph	T.	Judd	USDA, Agricultural Research Service
Kandice	H.	Kahl	Clemson University
Michael	L.	Kahn	Washington State University
Teh-Hui		Kao	Pennsylvania State University
Fred	J.	Karsch	University of Michigan
Harumi		Kasamatsu	University of California
Christina	K.	Kennedy	University of Arizona
Harold	C.	Kistler	Oregon State University
Steven	J.	Knapp	Oregon State University
Karen	E.	Koch	University of Florida
Renee	M.	Kosslak	Iowa State University
Susan	F.	Kotarski	Upjohn Company
David	S.	Kraybill	Ohio State University
Yankel	M.	Kupersztoch	University of Texas Medical School
Sylvia		Lane	University of California
Richard	A.	Ledford	Cornell University
Michael		Lee	Iowa State University
David	K.Y.	Lei	University of Arizona
James	E.	Leklem	Oregon State University
Geoffrey		Letchworth	University of Wisconsin
Hei		Leung	Washington State University
Leon		Levine	Leon Levine & Associates, Inc.
Harris	A.	Lewin	University of Illinois

Daniel	T.	Lichter	Pennsylvania State University
James	A.	Lindsay	University of Florida
Linda	M.	Lobao	Ohio State University
Steven	A.	Lommel	North Carolina State University
Frederick	O.	Lorenz	Iowa State University
Ann	E.	MacGuidwin	University of Wisconsin
Robert	J.	MacKay	University of Florida
Robert	A.	Martienssen	Cold Spring Harbor Laboratory
Joseph		Mascarenhas	State University of New York
Velimir		Matkovic	Ohio State University
John	E.	Mayfield	Iowa State University
Joseph		McGuire	Oregon State University
Bruce	A.	McPheron	Pennsylvania State University
Joy	A.	Mench	University of Maryland
Sebeeha		Merchant	University of California
James	D.	Metzger	USDA, Agricultural Research Service
Simin	N.	Meydani	Tufts University
Richard	W.	Michelmore	University of California
C. Donald		Miles	University of Missouri
James	R.	Miller	Michigan State University
David	W. S.	Mok	Oregon State University
Thomas	W.	Molitor	University of Minnesota
Robin	W.	Morgan	University of Delaware
Roy	O.	Morris	University of Missouri
Phylis	B.	Moser-Veillon	University of Maryland
Noelle	E.	Muggli-Cockett	Utah State University
David	J.	Mulla	Washington State University
Christopher	A.	Mullin	Pennsylvania State University
Lester	H.	Myers	Virginia Polytech Institute and State University
David	D.	Myrold	Oregon State University
Henry	T.	Nguyen	Texas Tech University
Susan		Nitzke	University of Wisconsin
K. Dale		Noel	Marquette University
Neil	L.	Norcross	Cornell University
Sharon	K.	Obendorf	Cornell University
Michael		Oglesbee	Ohio State University
Martin		Okos	Purdue University
David	J.	Oliver	University of Idaho
Cindy	S.	Orser	University of Idaho
Jane	M.	Packard	Texas A&M University
Samuel	A.	Palumbo	USDA, Agricultural Research Service
Linda	H.	Pardo	USDA, Forest Service
Gary	A.	Payne	North Carolina State University
John	P.	Pelissero	Loyola University of Chicago
Susan	S.	Percival	University of Florida
Max	J.	Pfeffer	Rutgers University

Todd	W.	Pfeiffer	University of Kentucky
Tim	T.	Phipps	West Virginia University
Joseph	J.	Pignatello	The Connecticut Agricultural Experiment Station
Karen		Potter-Witter	Michigan State University
Thomas	O.	Powers	University of Nebraska
Randell	S.	Prather	University of Missouri
Robert		Pruitt	Harvard University
Steven	G.	Pueppke	University of Missouri
Timothy	G.	Ramsey	USDA, Agricultural Research Service
Sandra	M.	Reed	USDA, Agricultural Research Service
Peter	J.	Reeds	Baylor College of Medicine
Daniel		Richter, Jr.	Duke University
Rebecca		Rico-Hesse	Yale University School of Medicine
Sandra	S.	Ristow	Washington State University
Justin	K. M.	Roberts	University of California
Jeanne		Romero-Severson	Agrigenetics, L.P.
Jay	A.	Rosenheim	University of California
Lindsey		Rustad	University of Maine
John		Ryals	CIBA - Geigy Corporation
Lowell	D.	Satterlee	North Dakota State University
Floyd	L.	Schanbacher	Ohio State University
John	W.	Schiefelbein, Jr	University of Michigan
Keith	K.	Schillo	University of Kentucky
Mary Anne		Schuler	University of Illinois
Karen	S.	Schumaker	University of Arizona
Lester	W.	Schwartz	Smith Kline Beecham Pharmaceuticals
Champa		Sengupta-Gopalan	New Mexico State University
John		Shaw	University of Kentucky
Ruth	M.	Shuman	Genra Systems Inc.
Frank	A.	Simmen	University of Florida
John		Sofos	Colorado State University
Diane	R.	Soprano	Temple University School of Medicine
Marla		Spivak	University of Minnesota
Gary		Splitter	University of Wisconsin
Thaddeus	B.	Stanton	USDA, Agricultural Research Service
Tammo		Steenhuis	Cornell University
Bruce		Stermer	The Noble Foundation
David	B.	Stern	Boyce Thompson Institute
Cecil	R.	Stewart	Iowa State University
Penny		Swanson	NW Fisheries Science Center
Anne		Sylvester	University of Idaho
Arthur	A.	Teixeira	University of Florida
Robert	O.	Teskey	University of Georgia
Peter		Thomas	University of Texas
Linda	S.	Thomashow	USDA, Agricultural Research Service
Michael	F.	Thomashow	Michigan State University

David	W.	Threadgill	Case Western Reserve University
Ronald	L.	Thune	Louisiana State University
John	D.	Tjepkema	University of Maine
Deryl	L.	Troyer	Kansas State University
John	T.	Trumble	University of California
Bruce	J.	Turner	Virginia Polytech Institute and State University
Gerald	A.	Tuskan	Oak Ridge National Laboratory
Rodney	K.	Tweten	University of Oklahoma Health Science Center
Christina	W.	Vertucci	USDA, Agricultural Research Service
George	J.	Wagner	University of Kentucky
Mary Kay		Walker-Simmons	USDA, Agricultural Research Service
Robert	J.	Wall	USDA, Agricultural Research Service
Bruce	P.	Wasserman	Rutgers University
David	F.	Weber	Illinois State University
Jon	D.	Weinstein	Clemson University
Frank		White	Kansas State University
Juergen	K. W.	Wiegel	University of Georgia
Kimberlyn		Williams	University of Florida
Milo	G.	Wiltbank	University of Wisconsin
William	H.	Wunner	Wistar Institute

The following individuals served as peer review panel members for other CSRS granting areas:

Lajpat		Ahuja	Great Plains System Research
Mahbub ul		Alam	Colorado River Salinity
John		Allen	University of Nebraska
James		Allen	University of District of Columbia
Arthur	L.	Allen	Virginia Polytechnic Institute and State University
Sharon		Anderson	Michigan State University
Verna	L.	Armstrong	American Association of State Colleges and Universities
Anita	N.	Azarenko	Oregon State University
Fred	W.	Bakker-Arkema	Michigan State University
Janet	K.	Baltzell	USDA, Cooperative State Research Service
Douglas		Barnett	USDA, Animal & Plant Health Insp. Ser.
William		Bauerle	Ohio State University - Retired
Jeri	L.	Berc	USDA, Soil Conservation Service
Duane		Berry	Virginia Polytechnic Institute
Larry		Beuchat	University of Georgia
Prasanta		Bhowmik	University of Massachusetts
Kimon	T.	Bird	University of North Carolina
Will	H.	Blackburn	USDA, Agricultural Research Service
Dale	G.	Blevins	University of Missouri
Norma		Bobbitt	Michigan State University
Claude		Boyd	Auburn University
Ernest		Brannon	University of Idaho
Carolyn	B.	Brooks	University of Maryland Eastern Shore
Paul		Brown	Purdue University
Paul	D.	Brown	University of Arizona
Douglas		Buhler	University of Minnesota
Gregory		Buyanovsky	University of Missouri
Jamie	M.	Cano	Ohio State University
William	W.	Carlton	Purdue University
Michael		Castagna	Virginia Institute of Marine Science
Thomas		Cathcart	Mississippi State University
Yud-Ren		Chen	USDA, Agricultural Research Service
Sharon	A.	Clay	South Dakota State University
George	E.	Cooper	USDA, Cooperative State Research Service
Jesus	A.	Cota	USDA, Forest Service
Lowell	E.	Crow	Western Michigan University
Randy		Deaton	Monsanto Corporation
Darrell		DeBoer	South Dakota State University
Rodney	C.	DeGroot	USDA, Forest Service
Margaret	R.	Dentine	University of Wisconsin
S.		Devadoss	University of Idaho
Thomas		Doerge	University of Arizona
Sam	L.	Donald	Alcorn State University
Catherine		Donnelly	University of Vermont

Ed		Dougherty	USDA, Agricultural Research Service
John		Dunmore	USDA, Economic Research Service
Thomas		Elder	Auburn University
George	C.	Fahey, Jr.	University of Illinois
Dan		Farkas	Oregon State University
Frank		Farmer	University of Arkansas
Sam		Feagley	Louisiana State University
William	C.	Feist	USDA, Forest Service
J. Marcos		Fernandez	Louisiana State University
Franklin	G.	Fisher, Jr.	Applied Systems Technology
Richard	W.	Fite	USDA, Animal & Plant Health Inspection Service
Jan		Flora	Virginia Polytechnic Institute and State
Richard	R.	Frahm	USDA, Cooperative State Research Service
Robert		Frederick	U.S. Environmental Protection Agency
Roy		French	USDA, Agricultural Research Service
F.	Kofi	Fynn-Aikins	Tunison Laboratory of Fish Nutrition
Marolo		Garcia	USDA, Animal & Plant Health Inspection Service
Lorraine		Garkovich	University of Kentucky
James	O.	Garner	Mississippi State University
Godfrey	A.	Gayle	North Carolina A&T State University
Robert	L.	Geimer	USDA, Forest Service
Melvin		George	University of California
John		Gierke	Michigan Technological University
Esther		Glover-Fahm	University of Wisconsin
Dennis		Gonsalves	Cornell University
Barbara	L.	Goulart	Pennsylvania State University
Sagar		Goyal	University of Minnesota
Wendy		Graham	University of Florida
Randolph	L.	Grayson	Virginia Polytechnic Institute and State University
Mark		Grismer	University of California
Gian		Gupta	University of Maryland
Tom		Haan	Oklahoma State University
Rosemarie	W.	Hammond	USDA, Cooperative State Research Service
Ellen		Harris	USDA, Human Nutrition Information Service
Sandra	A.	Helmick	Oregon State University
Otto		Helweg	Memphis State University
Charles		Hess	University of California
Howard		Hill	Iowa State University
Jeff		Hinshaw	North Carolina University
George	M.	Hopper	University of Tennessee
Maurice	L.	Horton	USDA, Cooperative State Research Service
Hayward	D.	Horton	Iowa State University
Y.	P.	Hsieh	Florida A&M University
Frank		Humenik	North Carolina State University
Silas		Hung	University of California
Jean	B.	Hunter	Cornell University

Geza		Ifju	Virginia Polytechnic Institute and State University
Haku		Israni	Prairie View A&M University
Johnie		Jenkins	USDA, Agricultural Research Service
Lawrence	A.	Johnson	Iowa State University
Sidney		Johnson	U.S. Geological Survey
J. Preston		Jones	USDA, Cooperative State Research Service
Arthur		Kelman	USDA, Cooperative State Research Service
Larry		King	Washington State University
Eileen	J.	Kladivko	Purdue University
Ellery		Knake	University of Illinois
Gary	W.	Krutz	Purdue University
King-Jau	S.	Kung	University of Wisconsin
Joseph	E.	Kunsmann	NASLUGC Acad. Committee on Organ. & Pol.
Michael		Ladisch	Purdue University
Alvin		Larke, Jr.	Texas A&M University
Terry		Lavy	University of Arkansas
Linda		Lee	University of Connecticut
Ann		Lichens-Park	USDA, Cooperative State Research Service
Rebecca		Lochman	University of Arkansas
Birl		Lowery	University of Wisconsin
Birl		Lowery	University of Wisconsin
Lee		Lynd	Dartmouth College
Susumu		Maeda	University of California
Harry		Mapp	Oklahoma State University
Maurice		Marshall	University of Florida
Harold	R.	Matteson	New Mexico State University
Christine		Matthews	Library of Congress
McKinley		Mayes	USDA, Cooperative State Research Service
Bruce		McAlpin	Miami - Dade Community College
Durant		McArthur	USDA, Forest Service
Sally		McCammon	USDA, Agricultural Research Service
Edward	L.	McCoy	Ohio State University
Kent	A.	McDonald	USDA, Forest Service
Gale		McGranahan	University of California
Mark	R.	McLellan	Cornell University
Scott	A.	Merkle	University of Georgia
George	E.	Merva	Michigan State University
George	E.	Meyer	University of Nebraska
Robert		Miller	Oklahoma State University
James	R.	Miller	Michigan State University
David		Min	Ohio State University
Nita		Minnifield	USDA, Agricultural Research Service
Russell	C.	Moody	USDA, Forest Service
Eddie	A.	Moore	Michigan State University
Gloria	A.	Moore	University of Florida
Robert		Moreau	Eastern Regional Research Center

Matthew		Morra	University of Idaho
Carmyn		Morrow	Texas Tech University
Wayne	K.	Murphey	USDA, Cooperative State Research Service
Darrell	D.	Nicholas	Mississippi State University
Elivia		Niebla	USDA, Forest Service
Gerald		Nielson	Montana State University
John	R.	Obst	USDA, Forest Service
Andrew		Ogram	Washington State University
Jiryis	S.	Oweis	U.S. Agency of International Development
Lowell	D.	Owens	USDA, Agricultural Research Service
Calvin	B.	Parnell, Jr.	Texas A&M University
John		Payne	USDA, Agricultural Research Service
Robert	M.	Peart	University of Florida
Penn	A.	Peters	USDA Forest Service
Gary		Peterson	Colorado State University
Janice	A.	Phillips	Lehigh University
Harry		Pionke	USDA, Agricultural Research Service
W. Jean		Porter	Tennessee Tech University
Dean	R.	Prestemon	Iowa State University
Annie	K.	Prestwood	University of Georgia
Lambertus	H.	Princen	USDA, Agricultural Research Service
Gyles		Randall	University of Minnesota
William		Rasmussen	University of Arizona
Donald		Reddell	Texas A&M University
Michael		Reed	University of Kentucky
Brent		Richburg	Kraft General Foods
Thomas		Rippen	Virginia Polytechnic Institute
Wayne		Robarge	North Carolina State University
Ed		Robinson	Mississippi State University
David		Rogers	Utah State University
Erwin	L.	Schaffer	USDA, Forest Service
James		Schepers	University of Nebraska
Stephen	W.	Searcy	Texas A&M University
Christine		Shoemaker	Cornell University
W. David		Shoup	University of Arizona
William	T.	Simpson	USDA, Forest Service
Horace		Skipper	Clemson University
Matt		Smith	University of Georgia
P. Gregory		Smith	Society of American Foresters
Lawrence	A.	Soltis	USDA, Forest Service
James		Steffe	Michigan State University
J. Edward		Surbrugg	PRC Environmental Management
Robert	W.	Taylor	Alabama A&M University
Aregai		Tecele	North Arizona University
Arthur	A.	Teixeira	University of Florida
Bart		Thielges	Oregon State University

Alton		Thompson	North Carolina A&T State University
Gary		Thorgaard	Washington State University
Michael		Timmons	Cornell University
Cruz		Torres	University of Colorado
Hao		Tran	USDA, Forest Service
Ronald		Turco	Purdue University
James	A.	Tweedy	Southern Illinois University
Charles		Ullery	South Dakota State University
Garbriella	A.	Varga	Pennsylvania State University
Jerry		Volesky	USDA, Agricultural Research Service
Van		Volk	Oregon State University
Bob		Volk	University of Nebraska
Renee	M.	Wagner	USDA, Agricultural Research Service
Leo		Walsh	University of Wisconsin
Acacia	A.	Warren	Tufts University
Lydia		Watrud	U.S. Environmental Protection Agency
Carl		Webster	Kentucky State University
David	M.	Weller	Washington State University
Kenneth		Wells	University of Kentucky
Fred	W.	Wheaton	University of Maryland
Sam		Williams	USDA, Forest Service
Ronald	W.	Wolfe	USDA, Forest Service
Mary	L.	Wolfe	Virginia Polytechnic Institute and State University
Craig	H.	Wood	University of Kentucky
Bruce	H.	Wright	USDA, Economic Research Service
Don		Wysocki	Columbia Basin Agricultural Research Center
John	A.	Youngquist	USDA, Forest Service
Paul		Zankowski	Harris Moran Seed Company
John	I.	Zerbe	USDA, Forest Service
Larry		Zibilske	University of Maine

